PERSONALITY CHARACTERISTICS OF DRUNKEN DRIVERS

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P. A. Wright

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ABSTRACT

The personality characteristics of convicted drunken drivers were investigated. Nineteen male offenders under the age of 35 were compared with equal numbers of alcoholics and normal controls matched for age and sex. All subjects were administered the Michigan Alcoholism Screening Test (MAST), the Purpose in Life Test (PIL) and the Eysenck Personality Questionnaire (EPQ). The results indicated that 84% of the drunken drivers could be considered to be alcoholic although their scores on the MAST were intermediate between those of the alcoholics in treatment and the normal controls ($p < .001$). Scores on the PIL test were lower for both alcoholics ($p < .001$) and drunken drivers ($p < .05$). The alcoholics also scored significantly greater on the Neuroticism scale of the EPQ than either of the other groups. No differences were found between the groups on the Extraversion and Psychoticism scales of the EPQ.

The drunken drivers were not considered to constitute a random sample of the general population on the basis of the demographic data and test scores. It is suggested that a drunken driving offence be recognized in many cases as an early indication of problem drinking, thus facilitating early intervention for assessment and treatment.

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CHAPTER 1

INTRODUCTION

1.1 GENERAL INTRODUCTION

Although the problem of the drunken driver is not a new one, it is only during the last 20 years or so that the true impact of this group on road safety has been realized. It is now generally agreed that small amounts of alcohol in the body will have a detrimental effect on driving skills and increase the accident risk of the driver.

Although there has been a considerable amount of research into the physiological and behavioural effects of alcohol, the exact mechanism by which it affects and impairs driving performance is difficult to determine. The use of simulated driving tasks has enabled a number of quantitative measures to be taken on the driving ability of intoxicated subjects and there are indications that alcohol influences driver confidence, attention, reaction time, time perception, and degree of alertness (Carpenter, 1962). Although many of the studies in this area are methodologically inadequate and cannot readily be applied to the actual driving situation, there is little doubt that alcohol causes some impairment of driving ability, even at blood alcohol levels as low as 30 mg/100 ml (McDermott, 1977; Venardos, 1975).

The implications of this with regard to traffic safety and accident fatalities are clear. Research in the United States of America based on blood alcohol testing, police records, and a number of other sources indicates that alcohol plays a role in half of the highway fatalities each year (NIAAA, 1972). This estimate does not include the thousands of others that are injured or disabled

through these accidents; neither does it take into account the costs involved such as property damage, medical expenses and loss of wages.

1.2 ALCOHOL AND ROAD ACCIDENTS

In a review of six studies concerned with the influence of alcohol on fatal and non-fatal automobile accidents in the USA, Little (1970) found that with regard to accident fatalities, between 55% and 64% of the drivers were found to have a detectable blood alcohol level. For single vehicle accidents only, these figures rose to between 70% and 83%. This latter increase is to be expected due to the fact that these drivers are more likely to have been directly responsible for the accident. Furthermore, it was found that a significant fraction of the driver victims had a blood alcohol level (BAL) exceeding 50 mg/100 ml.

An important point is that only one of these studies (McCarroll, 1961) employed a control group of non-accident involved drivers, matched for site, time, day of week and direction of travel. McCarroll found that 77% of this control group had a BAL less than 20 mg/100 ml and none had a BAL at or exceeding 25 mg/100 ml. For the fatal victims however, the respective figures were 29.2% and 50%. This led McCarroll to conclude that alcohol was strongly associated with single vehicle fatal accidents in his sample. Subsequent research has confirmed this relationship and indicates that alcohol does indeed contribute very strongly to the initiation of fatal automobile accidents (Johnston, 1976).

The causal relationship between blood alcohol levels and traffic accidents has been further supported by studying non-fatally injured drivers. The three studies in this area reviewed by Little

(1970) were those of Holcomb (1935), in Illinois, Lucas (1955) in Toronto, and Borkenstein (1964) in Grand Rapids, the dates indicating that this is by no means a recent problem. Holcomb (1935) compared 270 accident involved injured drivers with a non-matched control group of 1750 non-accident drivers. He found that 93.7% of the control group and 66.8% of the accident drivers had a BAL less than 50 mg/100 ml. However, only .4% of the controls and 13.8% of the accident victims had a BAL equal to or greater than 150 mg/100 ml, showing as expected, that accident involved drivers tend to have higher blood alcohol levels. Similarly, Lucas (1955) used 423 accident-involved drivers and 2014 controls matched according to the accident site and time of day (the study was restricted to accidents that occurred between 6.30 pm and 10.30 pm on Monday through to Saturday). While 91.3% of the controls had a BAL less than 50 mg/100 ml and only 1.4% had a BAL equal to or greater than 150 mg/100 ml, the respective figures for the accident-involved drivers were 77.5% and 11.4%.

In The Grand Rapids survey carried out by Borkenstein (1964), the accident sample was predominently composed of drivers from minor injury accidents. He used 5984 accident-involved drivers and 7590 drivers who had not been involved in any accidents. Ninety-six percent of the controls and 90.21% of the accident-involved drivers had BAL's less than 50 mg/100 ml, while 10% of the drivers involved in accidents and 3% of the controls had a BAL equal to or greater than 50 mg/100 ml. Blood alcohol levels equal to or greater than 150 mg/100 ml were found in only .18% of the controls as compared with 3.2% of the accident-involved drivers.

When taken together, the results of these studies indicate a definite positive relationship between the ratio of accident-involved drivers to controls and the BAL's.

Little (1970) also noted that the association between alcohol and accidents increases markedly with accident severity. Alcohol was detected in only 16.6% of the drivers in Borkenstein's (1964) study of predominently minor accidents, in from 22% to 47% of the drivers in studies including only hospitalized drivers and in over 50% of the drivers in all of the studies limited to those fatally injured.

While these studies indicate that accident risk increases with BAL, it is not possible to quantify this relationship on the basis of those studies reviewed. Neither is it possible to establish any "critical" level of blood alcohol for accident risk. Furthermore, few of the studies employed a matched control group and the sample constituents varied markedly from study to study. In concluding his survey, Little (1970) pointed out that although alcohol was detected in the non-accident control groups, it was detected more frequently in those involved in accidents.

> "It is this relative difference and not merely the presence of a detectable BAL among accident victims that shows that alcohol contributes to accidents." (p. 91)

A second feature of road accident statistics concerns the disproportionate number of young men aged between 16 and 25 involved in road accidents, e.g. of the total road accident fatalities in Australia in 1975, 56% were under 30 years of age and 35% were under 21 years. Whether this is a function of age-related characteristics or due in part to drinking has been the subject of a number of studies.

To determine the role of drinking in the over-involvement of young male drivers in accidents, Pelz, McDole and Schuman (1975) conducted a survey of 1670 men aged between 16 and 24 in Michigan, USA, and studied the accident records from four states during 1968-70 (before most alcoholic beverages could be legally bought by those under the age of twenty one). They found that by age 20, over half of the sample were drinking at least once a week and 19% were considered to be drinking heavily. Additionally, 58% reported that they had driven after drinking in the past month. They found a significant increase in drinking with age. Approximately a quarter of the men in the sample had been involved in an accident during the past year although fewer than 10% reported that they had been drinking prior to the accident. In order to ascertain whether or not the drinking increases the likelihood of an accident, the data were further analyzed after making adjustments for highway exposure (annual mileage and hazardous conditions such as driving after dark).

Age was found to be significantly associated with both accidents and violations-plus-warnings, with a maximum association at ages 18 and 19 years. When the effects of age were removed, drinking-driving behaviour was found to be significantly related to violations but not to accidents.

> "Hence it would appear that many young men who drive after drinking are likely to be social rebels who ignore traffic laws as well as alcoholic beverage laws. But on the average they are not more likely to crash their cars."
>
> (Pelz, McDole and Schuman, 1975, p. 962.)

Analysis of the crash statistics in the official files of Michigan, Texas, Colorado and Wisconsin for the period 1968-70, indicated that while the age group 18 to 19 incurred the greatest

proportion of accidents without drinking, those aged 22 to 23 had the greatest proportion of alcohol-involved accidents.

Alcohol consumption therefore, is not the sole causal factor in the accident involvement of men under the age of 21 years.

That the alcohol involvement in traffic accidents is not solely a foreign phenomenon is amply illustrated in the few surveys that have been conducted in Australia and New Zealand since 1973. Survey data collected in Victoria and Queensland indicate that over 50% of driver fatalities have been found to have a BAL in excess of 50 mg/100 ml compared with less than 2.5% in the normal driving population (McDermott, 1977). In Victoria during 1970-71, Hossack (1972) found that among the 158 victims examined, 50% had a BAL of 100 mg/100 ml or more and 40% exceeded 150 mg/100 ml. Levels in excess of 100 mg/100 ml were found in 68% of driver fatalities under 25 years of age. Similarly, Tonge (1972) found that 45% of 447 driver fatalities had a BAL in excess of 100 mg/100 ml. Of the 152 single vehicle accidents, 64% of the drivers had levels greater than 100 mg/100 ml, and 34% had a BAL greater than 200 mg/100 ml, thus supporting the earlier observation that alcohol is likely to be a greater factor in single vehicle crashes (McDermott, 1977).

Australian data regarding non-fatal casualty accidents have been made available due to recent legislation in South Australia and Victoria requiring blood alcohol tests for all adult road casualties. There was a total of 15,178 casualties in Victoria between October 1974 and August 1975. Of the 11,090 driver and motor-cyclist casualties tested, 22% had a BAL in excess of 50 mg/100 ml (the legal limit), 16.2% had a BAL in excess of 100 mg/100 ml, and

11.2% had a BAL in excess of 150 mg/100 ml. The respective percentages for non-driver casualties during the same period were 18.1%, 12.9% and 8.4%. Between October 1975 and August 1976, 26.4% of the 10,753 drivers and motor-cyclists had a detectable BAL. Of these, 23.4% had a BAL exceeding 50 mg/100 ml, 19.1% had a BAL exceeding 100 mg/100 ml and 13.8% had a BAL greater than 150 mg/100 ml.

Similar data collected in South Australia (McDermott, 1977) indicated that of the 7,570 samples tested during 1975, 15.5% had BAL's exceeding 80 mg/100 ml. Positive levels were detected in 24% of the drivers, 23% of the passengers and 33% of the pedestrians. In 1976, 14.6% of the 7,600 samples had a BAL exceeding 80 mg/100 ml with positive levels being detected in 22.5% of drivers, 22% of passengers and 31% of pedestrians. Sixty-three percent of drivers with illegal BAL's (80 mg/100 ml and above) were in excess of 150 mg/100 ml.

Comparable statistics were obtained from a survey of 474 consecutive road crash casualties at one Melbourne hospital between June and September 1974. Of the drivers (38%) and motor-cyclists (7%) in the sample, positive alcohol levels were detected in 29% and 24% of cases respectively, with 70% of all samples indicating a BAL greater than 50 mg/100 ml. Of the casualties with positive levels, 57% were under 30 years, 52% presented themselves on Saturday or Sunday (compared with 32% of alcohol negative casualties), and 59% were admitted between 9 pm and 3 am (McDermott, 1977).

The only control data for the Australian driving public with regard to alcohol levels were collected by Duncan (1976) in Canberra in 1971 and 1972. He found that almost 5% of drivers had BAL's of

80 mg/100 ml or greater in the period between 10 am and 2 am, but this was the average overall days of the week, and data for time of day by day of week were not reported (Johnston, 1976).

Random breath testing in Victoria in July 1976 indicated that 2.2% of 6,000 drivers tested had an illegal BAL although more drunken drivers were detected after 10 pm and during weekends. From this it can be concluded that detectable and illegal blood alcohol levels are found in a far greater percentage of road accident deaths and casualties in Australia than among the general driving population (McDermott, 1977).

That alcohol is an important factor in road accidents in New Zealand is supported by Hart's (1975) survey of 461 road accident casualties admitted to Christchurch Hospital during August, September and November 1972. Of the 370 drivers and motor-cyclists available for study, 27% of drivers had a detectable BAL with the average being 142.8 mg/100 ml. Of these, 19% were over the legal limit of 100 mg/100 ml. Sixty-eight percent of the positive blood samples were from drivers involved in single vehicle accidents.

Stronger evidence for this relationship is revealed in a detailed study of the role of alcohol in fatal road accidents in New Zealand for 1977 (Bailey, 1979b). Information was collected on all drivers involved in fatal accidents and for all passengers, cyclists and pedestrians who were killed.

At least 46% of the 625 fatal road accidents for that year were found to involve alcohol (over 50 mg/100 ml) although in only 29% of cases was the absence of alcohol established. Furthermore, 54% of all drivers at fault in fatal accidents, 69% of car drivers who were travelling at excessive speed, and 65% of drivers at fault in

fatal accidents involving one car only (excluding those involving pedestrians or cyclists) involved alcohol.

When only those accidents occurring on a Friday or a Saturday night are considered, these figures rise to 76%, 86% and 79% respectively, indicating that this is the period of risk for fatal accidents, particularly between the hours of 11 pm and 4 am.

An analysis of the age of these drivers indicated that 54% of those at fault in all fatal accidents, and those involving alcohol, were under 25 years of age, while only 22% of licensed drivers were in this age group. Furthermore, over 70% of such drivers at fault in fatal car accidents were driving at excessive speed, although they tended to have lower BAL's than other drivers (see Table 1).

> "This appears to demonstrate the increased risk of consuming alcohol before driving at an excessive speed, the two factors then having a cumulative effect."
>
> (Bailey, 1979b, p. 5.)

In addition to the finding that young male drivers are over-represented in fatal road accidents, whether or not alcohol was involved, they appear to have much higher rates of involvement in such accidents. Drivers under 20 years for example, were involved in fatal accidents seven times as often as drivers aged 45 years and over, and ten times as often when alcohol was involved.

In conclusion, alcohol can be considered to be a major contributing factor in road accidents in the USA, Australia, and New Zealand, particularly fatal and single vehicle accidents. This is not to advocate however, that it is the only factor operating in road accidents as one cannot discount the effects of tiredness, stress and so on. The point is that alcohol has been identified on many

TABLE 1: Percent Alcohol Distribution by Age for Drivers at Fault in Fatal Accidents (1977).

Age	Blood Alcohol Range (mg/100 ml)			
	51-100	101-150	151-200	Over 200
<20	23	31	28	18
20-24	18	37	29	16
25-44	6	19	39	36
>44	0	30	20	50
All ages	13	28	31	28

(Bailey, 1979b, Table 9, p. 26.)

occasions as being a major factor involved and therefore warrants considerable attention. Efforts made to reduce this factor may also produce a reduction in road accident statistics.

The question that follows such convincing data on the role of alcohol in traffic accidents, is to what extent can these drunken drivers be considered a random sample of the driving public as a whole.

The major issue surrounding this problem is whether this group is predominently composed of alcoholics and problem drinkers, or whether they are persons who on occasion drive after drinking; that is, they are social drinkers only.

As noted above, a sizeable proportion of drivers involved in serious road accidents have high blood alcohol levels. For example, the mean BAL of intoxicated drivers sampled by the New Zealand Ministry of Transport is close to 170 mg/100 ml (Kirkwood, 1976). As it has been found that heavy social drinking rarely produces a BAL above 150 mg/100 ml and that most social and professional drinking results in a BAL of between 20 mg/100 ml and 80 mg/100 ml (Birrel, 1965), it is unlikely that such persons could be considered normal social drinkers, definitions aside. As an example, Birrel (1965) analyzed blood alcohol levels in 1,715 suspect drunken drivers and found they ranged from zero to 460 mg/100 ml with a mean of 220 mg/100 ml. The amounts of liquor represented by a level such as this are far greater than those consumed in normal social drinking, it being equivalent to a pint of whiskey in one hour. In a second study, age by alcohol analyses on 8,550 drunken drivers in Victoria showed that males aged 20 to 24 comprised a quarter of the sample and had alcohol levels between 200-209 mg/100 ml, well above that achieved by moderate social drinking (Birrel, 1970).

The comparable data for New Zealand indicates that of the 11,767 drivers given blood alcohol tests in 1977 (an increase of 31% since 1973), 55% were under 25 years of age, and 59% had a BAL greater than 150 mg/100 ml (Bailey, 1979a). Furthermore, as indicated in the analysis of fatal road accidents in New Zealand (Bailey, 1979b), the mean BAL of drivers given a blood test as a result of a positive breath test increases with the age of the drivers tested (see Table 2).

When compared with the age and BAL analysis for drivers involved in fatal road accidents, the breath testing procedure appears to select a higher proportion of young drivers with low blood alcohol levels (66% of those drivers under 20 years had a BAL of 150 mg/100 ml or less), and a lower proportion with high levels, whereas for older drivers the reverse is true.

It has been argued that "accidents involving drunken drivers are in a large measure a problem of the pathological drinker rather than the casual drinker." (Kirkwood, 1976). On the basis of the blood alcohol analyses discussed above, it would seem unlikely that such persons had consumed only moderate amounts of alcohol prior to driving their vehicles. While this may be indicative of an underlying drinking problem, Bridge (1972, p. 71), on the basis of personal involvement as a police physician, concludes that "the drunk driver is at least a problem drinker if not a full blown alcoholic."

Before considering this question in greater depth, the available knowledge on alcohol and its relation to traffic accidents is summarized below:

TABLE 2: Mean Blood Alcohol Levels for New Zealand Drivers given Blood Tests in 1977 (mg/100 ml).

Age	Category of Driver		
	At Fault	Not at Fault	Breath Tests[a]
<20	151	85	129
20-24	148	128	156
25-44	184	162	187
>44	203	96	213
All ages	168	125	165

[a] The category of Breath Tested Drivers refers to those drivers in 1977 from whom a blood sample was taken under the Transport Act, after a breath test.

(Bailey, 1979b, Table 10, p. 27.)

Summary:

a) At least a half of the injured and fatally injured road accident victims have a significantly high blood alcohol concentration.

b) This blood alcohol concentration is greatest in drivers involved in single vehicle accidents.

c) The more severe the accident, the higher the blood alcohol levels tend to be.

d) Blood alcohol levels equal to or greater than 100 mg/100 ml are an important factor in fatal road accidents.

e) A disproportionate number of young males are involved in all road accidents and accidents involving alcohol.

f) Young drunken drivers tend to have lower blood alcohol levels than those in the older age groups.

g) The high blood alcohol levels found in many drivers are unlikely to have been the result of moderate or responsible social drinking.

1.3 THE INCIDENCE OF PROBLEM DRINKING AMONG DRUNKEN DRIVERS

As mentioned above (see Section 1.2), the high blood alcohol levels found in drivers and road accident victims would seem in many cases to be indicative of a serious drinking problem.. Several studies have attempted to determine the incidence of alcoholism and problem drinking among those who have been convicted for driving with an excess BAL in a bid to define more clearly the composition of this portion of the population. Perhaps the first study of this type was

conducted in Sweden by Goldberg in 1955 (cited in Fox and Fox, 1963, p. 40). Data concerning drinking habits, offences for drunkenness and for criminal offences were obtained on nearly 2,000 men convicted for drunken driving during a one year period. It was found that 45.4% of the drivers, as compared with 8.8% of the general population, fell into the categories "alcohol addicts" or "alcohol misusers", that is, they had received treatment for alcoholism or had been convicted for drunkenness on one or more occasions during the preceding ten years.

Similarly, Popham (1956) found that of 427 males charged with impaired or drunken driving in Toronto during 1954, 2.6% had been clinic patients for alcoholism compared with a 1.2% expected incidence of alcoholism in the drinking population. However, the techniques used to derive this latter figure are of somewhat dubious validity.

Selzer, Payne, Gifford and Kelly (1963) examined 67 drivers arrested in Michigan for driving while intoxicated in order to determine the incidence of alcoholism amongst the sample as defined by Keller (1960) - "alcoholism is a chronic disease manifested by repeated suspicion-arousing drinking so as to cause injury to the drinker's health or to his social or economic functioning." They found that 57% of the drivers could be classified as alcoholic, 15% as probably alcoholic and four drivers as pre-alcoholic or problem drinkers. Taken together this means that at least 78% of the sample were considered to have serious drinking problems. Furthermore, 67% of the drivers also suffered from a recognisable psychiatric illness other than alcoholism.

A more extensive study of this problem was undertaken by Waller (1967) in California over a period of 2 months. He compared

four groups of drivers: 150 drunken drivers, 33 accident-involved drivers who had been drinking but were not arrested, 117 sober drivers involved in accidents, 131 drivers with moving violations, 19 drivers with citations plus warrants, and 150 incident-free drivers. For all groups the driving record was obtained, and any information available about the number of and reasons for previous contacts with the county welfare and probation departments, the alcoholism rehabilitation clinic, state mental hospitals, family service agencies, and police departments throughout the country. The screening criteria for problem drinkers were two or more previous arrests involving drinking or identification by a community agency as a problem drinker. Although not statistically significant, more drunken drivers (87%) were found to be known to the police department and community agencies and to have contacted them (81%) because of an incident or problem related to alcohol, than for any of the other groups. They also exceeded all other groups in the number of arrests per person (6.5) on a number of different charges. Sixty-three percent of the drunken drivers, 50% of the drivers with accidents after drinking, and 30% of the drivers with warrants could be identified as problem drinkers on the basis of community information alone. Only 3% of the incident-free drivers, 8% of the drivers with violations and 14% of the non-drinking drivers with accidents could be so classified. In the majority of cases, the drunken drivers were found to have marital problems related to alcohol. In many cases this problem had been evident 5 years previously and most had contacted some community agency before the age of 25 or 30 years.

The high correlation between a record of arrests due to drinking and the identification of a drinking problem suggests that

social drinkers are not likely to have two or more arrests involving drinking.

In the light of possible definitional problems regarding alcoholism and problem drinking, a second technique for determining the drinking habits of drunken drivers has been tried. This technique involves an examination of the incidence of liver disease among traffic accident fatalities. Two studies by Waller in California (cited in Whitlock, Tonge, O'Reilly, Davison, Johnston and Biltoft, 1971) have indicated the incidence of fatty changes or cirrhosis of the liver among such drivers to be around 25%. However, further problems arise in setting out suitable diagnostic criteria for this examination and Waller has been criticized in this instance for the type of examination involved.

Baker and Spitz (1970) examined microscopically the livers of 120 drivers killed in road accidents in Baltimore. They found only two with early cirrhosis and six with severe fatty alteration of the liver. They thought that it would be unwise to use cirrhosis and severe fatty change in the liver as indicators of problem drinking among drivers.

In an attempt to decide whether the heavy drinker or the alcoholic is at fault here, Whitlock et al. (1971) examined the relationship between alcoholism, cirrhosis of the liver and fatal accidents in persons killed on the roads in the Brisbane area. Assessment was made by a careful histological examination of the liver and estimation of blood and urine alcohol levels. Supplementary to this, a full assessment of the social circumstances of the victim and his or her drinking habits and health was carried out. The victims in this study were predominently male and under 30 years

of age. Of those aged 29 or less, 59% had a BAL in excess of 100 mg/100 ml, while 69% of those aged 30 to 49, and 36% of those aged 50 or older reached this level. Interesting also, was the finding that those under 29, with a high BAL, were classed as moderate regular drinkers, indicating that a sizeable number of young men, who are not regarded as heavy drinkers, do on occasion drink excessively. As found in other studies, 21 of the 26 drivers with a BAL greater than 100 mg/100 ml were involved in accidents during the night or early hours of the morning. Of the 46 drivers in the study, only six were known abnormal drinkers and nine drank regularly, heavily. The pathological findings failed to support those of Waller (1967) as only 4.3% of all drivers and 6.4% of drivers over the age of 25 had cirrhosis. However, 49.2% of subjects had fatty changes, 20% of those being of a moderate or severe kind. The incidence of cirrhosis in this study was higher than that found in the general population (1.6-2%) although the authors were unwilling to credit this to alcohol alone. Furthermore, the sample involved in the study was small in number, with the number of subjects in each category being less than ten in all but one case.

It appears that the results of liver analysis studies can be interpreted either way depending on what the researcher wants to find. If the hypothesis is that alcoholics will be found in greater numbers then the higher incidence of liver disease will be interpreted as evidence for this. If on the other hand the hypothesis is that social drinkers or young people with a general disregard for the law are at fault, then the higher incidence rates will be accepted as such but rejected as evidence of alcoholism on the grounds that the liver damage cannot be directly attributed to alcohol consumption.

Rather than merely trying to classify drunken drivers as problem drinkers or non-problem drinkers, Sandler, Palmer, Holmen and Wnykoop (1975) investigated a wide range of symptoms of problem drinking among drivers arrested for drunken driving in Phoenix. Information was collected on all such persons subsequently enrolled in an educational programme, consisting of police records, the Michigan Alcoholism Screening Test (MAST), personality scales, and other self-report items related to problem drinking. On the basis of this information, 281 (37%) clients were classified as "high-risk" problem drinkers. Those selected were interviewed to obtain further information about their drinking behaviour. From this assessment interview, a total drinking-problem summary score was derived for each client. All ratings were based on the clients' reports of present drinking problems, defined as those occurring during the previous four months. Ninety percent of the subjects were male, 85% were between 20 and 49 years of age, and over 60% were white. Although the majority were married, 30% were either divorced or separated. Occupationally, the majority were engaged in blue-collar work, with 73% employed full-time and 18.5% unemployed.

With regard to the drinking problem characteristics of the clients, almost 20% reported an increased tolerance to alcohol, 45% reported drinking for the effect of alcohol, 26% reported missing meals while drinking, 34% reported experiencing blackouts, 17% drank in the morning, 14% reported experiencing shakes during the morning after drinking and 11% reported being intoxicated at work. Concerning the effect drinking has had on their life adjustment, almost 25% reported an adverse effect on their health, over 50%

reported an adverse effect on family relationships, over 12% reported that drinking had caused some problems with their friendships, and 16.7% found that it had caused problems at work. Many of these drivers considered themselves to be problem drinkers (22%), wanted to change their drinking behaviour (27%), and wanted help to do so (22%).

A total problem summary score of 5 or greater was arbitrarily established as a criterion for classifying a problem drinker, indicating that the client had at least five moderate problems, three moderate and one severe, or two severe and one moderate problem. On this basis approximately 80% of the clients were able to be classified as problem drinkers, almost four times the number who so identified themselves.

The major points to become evident in this study were

(i) a high percentage of the convicted drunken drivers were concurrently experiencing other drinking related problems, and

(ii) although rehabilitation for drinking problems would be appropriate for this group, the initial task would be one of persuading them to recognize their own problem.

Using a different means of classification Fine, Scoles, and Mulligan (1975) investigated the incidence and severity of alcohol use and abuse in a population of persons arrested in Philadelphia for the first time for driving while intoxicated. The sample consisted of 1,500 persons who chose to attend a psychosocial evaluation unit and an alcohol safe-driving school. Data were collected from an extensive interview with the client and an interview with the client's spouse.

On the basis of two sets of questions pertaining firstly to the number and degree of physical and behavioural symptoms of excessive alcohol use and secondly, to the rate and total consumption of alcohol in the preceding month, each client was assigned to a level of alcohol impairment. Briefly, impairment group one consisted of those who typically drink alcohol once or twice a week and on such occasions not usually more than three quarts of beer or six shots of whiskey. They may also drink to excess once or twice a month. Group two was comprised of persons who drink at least twice a week and during a drinking session consume a minimum of five quarts of beer or two pints of liquor. They also exhibit one or more of a number of specified behavioural characteristics. Group three typically consume alcohol daily, their average intake being at least five quarts of beer or three pints of whiskey. They also exhibit one or more of a number of specified behavioural characteristics as well as reporting problems with the family, the work situation and the police.

The results of this classification showed that of the sample, 45.7% could be placed in impairment group one, 48.1% in group two and 6.3% in group three. A total of 54.4% (groups one and two) could therefore be considered heavy drinkers compared with an expected 12% in the general population. There were also marked differences in level of impairment depending on age, with those under 40 showing a greater amount of impairment than those over 40 years. Consistent with previous research, the highest percentage of all drinking (80% of group two and three drinkers) takes place between 20 and 24 years and then decreases with advancing age.

Finally, Venardos (1975) found that of the 1,426 drunken drivers referred to the Albuqueque Alcohol Safety Action Programme (ASAP) between June 1971 and June 1973, 52.9% could be classified as problem drinkers on the basis of the US Department of Transportation Classification.

Of the total sample, 79.3% of the drunken drivers usually drank beer, 30.4% got drunk once a month or more and 16.5% once a week or more. The majority felt that their drinking was not a habit (80.4%) and most got drunk on special occasions only (35.7%). With regard to their drinking habits, 37.2% felt guilty about their drinking, 22.5% got into fights while drinking, 56.2% wanted to cut down and 10.9% had problems with their job because of drinking. Furthermore 52.2% received complaints from their spouse about their drinking.

When compared with a group of "average" drivers and a group of alcoholics, the drunken drivers were between the two on most of the drinking measures. When compared to the "average" driver (roadside sample), the drunken driver had a greater preference for beer as opposed to other beverages. Perhaps the most striking difference between the two groups was in the blood alcohol levels as shown in Table 3.

The difference in blood alcohol levels plus the fact that the roadside survey interviews and breath tests were conducted during peak arrest hours (7 pm - 3 am), would seem to indicate that the primary difference between the two groups was not that one group was unlucky enough to get caught.

Compared with the alcoholic control groups however, the drunken driver was more likely to stay drunk for shorter periods

TABLE 3: Blood Alcohol Levels of Drunken Drivers and "Average" Drivers.

BAL (mg/100 ml)	Drunken drivers (%) (n = 1,426)	Average drivers[a] (%) (n = 2,632)
0- 90	2.8	91.6
100-140	14.1	4.2
150-190	34.5	2.6
200-240	27.8	.8
250+	20.8	.8

[a] The average driver group consisted of a randomly selected roadside sample of drivers.

(Venardos, 1975)

of time, have asked for help with his problems less often, have fewer spouse complaints about drinking, have fewer drunken driving and drunk arrests, have fewer fights when drinking and fewer problems with their jobs through alcohol. These significant differences between the groups would seem to suggest that the drunken driver can be considered neither a normal social drinker nor an alcoholic on the basis of these drinking measures alone.

From these studies one can therefore conclude that problem drinkers and heavy users of alcohol are indeed substantially over-represented among those drivers involved in road accidents or those convicted for driving with an excess BAL.

A second approach to this problem has been primarily concerned with the frequency of accident involvement of alcoholics as compared to the rest of the population.

Schmidt and Smart (1959) obtained data on the accident records of 98 male patients in treatment for alcoholism. The information was obtained by interviewing the patients and checking the data against official accident records. When compared to the general driving population in Ontario, it was found that this sample of alcoholics drove more frequently after the consumption of alcohol, had more convictions for drunken driving, more suspensions from driving because of impairment and, finally, were involved in more accidents per driver and per mile driven than the general population. It was also found that the sample of alcoholics drove more than the Ontario drivers in general, thus accounting in part for the reported differences. No difference was found however, in the rate of non-drinking accidents per

driver and per mile driven, suggesting that drinking is one of the crucial factors contributing to the high rate of accidents among alcoholics.

That alcoholics do appear to be a greater accident risk had led to speculation as to whether this is due solely to the influence of the alcohol on driving performance, or whether it is a function of some personality characteristic of the alcoholic driver.

In order to determine the type and number of traffic violations associated with the different levels of alcoholism and other medical conditions, Waller (1965) compared the accidents' experience of 256 drivers with alcoholism as a primary diagnosis, 126 drivers with other medical conditions plus a drinking problem as a secondary diagnosis, 1,319 drivers with a medical condition but no drinking problem and 921 drivers with no known medical condition. Thirty-three percent of the sample were found to have an excess BAL. The data analysis revealed the following differences:

(i) 60% of accidents involving persons with primary alcoholism, 30% involving persons with a secondary drinking problem, and 10% involving persons with other medical conditions or none, occurred after drinking.

(ii) alcoholic drivers were innocent victims in only one out of eight of their accidents compared with a ratio of 1 : 3 for those with other medical conditions and 1 : 2 for those with no condition.

(iii) accidents involving alcohol were more likely to be single vehicle accidents.

(iv) drivers with alcoholism and other medical conditions also had a greater proportion of such accidents when sober than the comparison group.

(v) drinking accidents of the alcoholic drivers were distributed throughout the day more evenly than the accidents of non-alcoholic drivers, and they were more likely to occur between 6 am and noon.

(vi) 20% of non-accident violations by alcoholic drivers were for drunken or reckless driving in comparison with 2% by the other groups.

(vii) persons with alcoholism and other psychosocial disorders had one and a half times as many violations for vehicle defects as persons with organic medical conditions and persons with none.

(viii) the proportion of convictions for driving with a suspended or revoked licence or without a licence in possession was twice as great for drivers with alcoholism as for drivers with other medical conditions.

The observation that alcoholics also have a high proportion of sober accidents similar in pattern to that of drivers with other psychosocial disorders has led to the suggestion that this higher risk among alcoholics can be explained in part by basic personality differences.

A strong proponent of this view, Smart (1969) argues that although no reliable estimate is available, there is a strong indication that alcoholics may be over-represented among sober accident drivers, but not to the extent found among drinking accident drivers. He postulates that a variety of physical and psychological

characteristics associated with alcoholism could also be related to accident involvement, for example, visual disturbances, slowed reflexes, psychopathic or sociopathic personalities, and a number of other labels often ascribed to alcoholics.

The crux of this argument lies in the assumption that alcoholics also have a higher than expected sober accident rate. On re-examining this question, Waller (1969) estimated that the non-drinking accidents of alcoholics occur in approximately the same miles of driving exposure per driver as do the non-drinking accidents of drivers without alcoholism. That is, the accident rates when not drinking, of persons with alcoholism, are no greater than those of other drivers.

Although there is limited evidence to suggest that alcoholics may be less cautious and drive faster when intoxicated than non-alcoholics, Waller (1969) was of the opinion that the pharmacological effects on the nervous system produced by the high blood alcohol levels found among these drivers would be the major influence in these accidents.

The data and research in this area however, are scarce and little is known about the interaction of these two factors, bearing in mind that alcohol affects different individuals in different ways. Clearly, if this question is to be resolved, a more intensive study of the accident experience of alcoholics at various blood alcohol levels is required.

Regardless of whether psychological or pharmacological influences play the major role here, there are important implications for countermeasures designed for the rehabilitation of drunken drivers. Most of the methods that have been used to combat the

drunken driver have been consistent with the view that the driver is usually a casual drinker who had had an accident because he or she was irresponsible or had a misguided notion of his or her ability to function adequately under the influence of alcohol. It is assumed that if the public can be made aware of the dangers of driving under the influence of alcohol, and if the penalties for this behaviour are sufficiently severe and rigorously enforced, the problem will be removed or much reduced.

The high BAL's found in first offenders arrested for drunken driving, and the disproportionate numbers of problem drinkers amongst this group clearly indicate that the rehabilitation programmes must be directed toward producing both a non-alcoholic person as well as a sober driver. Furthermore, the frequency of reoffending, and the number of violations for driving with a revoked or suspended driver's licence incurred by alcoholics, suggest that present measures for dealing with drunken drivers are ineffective with this particular subgroup. What appears to be needed in addition to the legal sanctions and educational courses is the early identification of alcoholism among drunken drivers and subsequent referral for treatment of this problem.

1.4 DEMOGRAPHIC AND PERSONALITY CHARACTERISTICS OF DRUNKEN DRIVERS

Although those persons who drink before driving are a heterogeneous group, certain characteristics among those convicted for this offence consistently appear in those studies concerning the demographic, social and personality characteristics of this group. These characteristics can be summarized as follows:

(i) In general, persons convicted for drunken driving, or those involved in alcohol-related accidents tend to be males under the age of 25 years,

(ii) they have a higher than expected incidence of marital separation or divorce, and

(iii) they tend to belong to the lower socio-economic classes, that is, the skilled, semi-skilled and unskilled occupations, with workers in the professional, managerial, clerical and technical groups being under-represented (Anderson, 1979; Bailey, 1979a, 1979b; Fine, Scoles and Mulligan, 1975; Hart, 1975; Hurst, 1979; Selzer, Payne, Gifford and Kelly, 1963; Selzer, Vinokur and Wilson, 1977; Venardos, 1975).

Several explanations have been offered to account for this profile of the drunken driver. With regard to socio-economic status, those in the lower groups have a higher accident rate in general when measured for minor or serious injuries than other groups (Hart, 1975). This in turn could be because they are either

(i) more aggressive or careless drivers, or
(ii) their vehicles may be older or more dangerous, or
(iii) they may comprise the bulk of the drivers on the road.

Alternatively, persons in the upper socio-economic groups may drive less often after drinking, they may drive on less well monitored roads after drinking, or they may be more favourably and leniently treated by traffic officers. As yet there is no empirical research with which to support or refute any of these explanations.

The young age of the typical drunken driver could be a result of the higher accident risk of young people in general (Pelz, McDole and Schuman, 1975), their drinking practices, or a combination of the two. Bailey (1979b) found however, that there is no tendency for the young drunken drivers to drive very old cars.

As discussed in the previous section, many studies have focused on the prevalence of problem drinking or alcoholism among drunken drivers. Few if any, however, have taken into account the actual drinking patterns of this group.

In a New Zealand survey of 356 persons who had previously been breath-tested by a traffic officer, and 349 having been involved at some time in a motor accident (as driver) or injured in an industrial accident within two hours after drinking, Hurst (1979) found that these groups had no more in the five-plus times a week drinking category than were found in the all male drinking population. Furthermore, they were not much more likely to drive after a drinking occasion than were all males. The factor differentiating these groups from the rest of the male drinking population lay in the amount of alcohol consumed on each occasion. Hurst (1979) found the following significant differences in drinking practices among those studied as compared with the general male population:

(i) significantly more members in each group, on their last drinking occasion, consumed an amount of alcohol likely to have resulted in an unsafe BAL (greater than 80 mg/100 ml),

(ii) they are twice as likely to have had their last drink in a hotel,

(iii) members of both groups were more likely than the general male population to report having started regular drinking before the age of 17 years,

(iv) members of the drunken driver groups were twice as likely to report that they were drinking more than they were happy with compared to the general male population of drinkers,

(v) they were twice as likely to remember having felt at some time that they should cut down, although those who felt this way were no more likely than the general population to actually reduce consumption.

With regard to medical factors, no significant differences were found between these groups and the rest of the population, although significantly more had been advised by their doctor that drinking was likely to affect their health. This could be regarded as an indication of the heavy drinking habits of the drunken drivers.

A similar, although more extensive investigation of 273 accident victims, drivers receiving citations, and controls was undertaken by Perrine (1970) in Vermont. Measures of biographical data, drinking history, driving history, driving attitudes, and personality characteristics were taken. The drinking patterns of the drunken drivers corresponded to those found by Hurst in that this group had the highest proportion of daily beer drinkers as well as the highest usual beer quantity consumed (52% reported drinking five bottles of beer or more at a sitting).

Regarding driving history, more drunken drivers had two or more licence suspensions, while more of all citation group drivers had previous convictions for prior traffic violations.

The personality measures used in this study consisted of the extraversion and neuroticism scales of the 57 item Eysenck Personality Inventory (EPI). No significant differences were found among the groups on either of the scales.

Although not indicated in this study, many researchers involved in this field contend that personality factors constitute an important influence on driving behaviour and are of considerable significance in accident causation. Accident-involved drivers have been found to have poor control of hostility, low tension tolerance and were fearful of loss of love and support (cited in Signori and Bowman, 1974). Selzer, Roger and Kerr (1968) also found paranoid thinking, suicide proclivity and depression to be associated with accident involvement in normal drinkers. Understandably, stress has also been implicated in causing accidents and being the deciding factor in fatal accidents suspected of being suicides. Venardos (1975) found that the driver who is involved in a fatal accident is more likely to report recent stress. McMurray (1970) found that during the year of their divorce, significantly more of the divorced subjects, except male plaintiffs, had higher accident rates than expected on the basis of their previous seven years' driving record. The 410 divorced drivers involved had an accident rate twice that of the average driver during the seven year period studied and an even higher rate during the six months before and after the divorce.

Concerned with the personality characteristics of drunken drivers, Selzer, Vinokur and Wilson (1977) compared 306 drunken drivers, 289 alcoholics and 302 controls in an attempt to determine whether they resemble the average driver population or whether they constitute a distinctive group. In order to assess the subject's susceptibility toward answering questions in a socially desirable way, the Crowne-Marlowe Social Desirability Scale was administered. The drunken drivers were found to have the greatest tendency to

both assert good and deny bad things about themselves while the alcoholics were least likely to deny bad things about themselves. A statistical correction was used to correct this bias in the results. An examination of drinking patterns revealed several significant differences among the groups:

(i) while the alcoholics drank more to relieve tension and had more troublesome effects from drinking than either of the other two groups, they also drank more for social relaxation and experienced more comfortable effects than the other two groups.

(ii) the men arrested for drunken driving drank more for tension relief and for social relaxation and experienced more troublesome and more comfortable effects from drinking than the control group.

(iii) the alcoholics were the only group to have a higher mean score on drinking for tension relief than for social relaxation.

To assess family and job stress, the subjects were asked to give ratings on a number of questions investigating problems with the family and work. The alcoholic subjects reported significantly more stress, poorer relations, more problems with their families and jobs, and found these problems significantly more disturbing than did either of the other two groups. No differences were found between the drunken drivers and the controls.

Personality variables were measured by means of a shortened version of the responsibility and self-control scales of the California Psychological Inventory. On the responsibility scale (measuring degree of responsibility one feels toward others

and the need felt to participate in and live by the rules of the community), the alcoholics and drunken drivers were very similar and significantly less responsible than the controls. The alcoholic group scored significantly lower in self-control than either of the other two groups whose means did not differ significantly. Significant differences were also found in measures of self-esteem with alcoholics having the lowest, and the control group the highest. Similarly, alcoholics were found to be significantly more depressed than drunken drivers, who were in turn significantly more depressed than controls as measured by form G of the Depression Adjective Check Lists and the Short Zung Self-Rating Depression Scale. This ordering of the three groups was also maintained on measures of suicide proclivity, paranoid thinking and aggression. Furthermore, both alcoholics and drunken drivers resorted more to oral substance use (whether alcoholic or non-alcoholic) and less to other means when coping with tension or depression than did the control population.

When divided into two groups according to scores on the Michigan Alcoholism Screening Test (MAST) (using a cutoff of 6 points), those drunken drivers scoring above this were closer to the alcoholics on almost every scale than those scoring below 6 points. However, the scores were not as extreme as those of the alcoholics. On every measure where the total group of drunken drivers was significantly less extreme than the alcoholics, the subgroup of those who scored 6 points or above on the MAST was also significantly less extreme.

In general, the measures indicated that the drunken drivers were not merely a mixture of alcoholics and social drinkers; rather

it was composed on the one hand of a group of alcoholics (based on MAST scores) and on the other of a group of potential alcoholics (in that they differed significantly from the control group in the direction of the alcoholic's scores). Like alcoholics, drunken drivers appear to be a heterogeneous group. Those in this study differed from both alcoholics and a group of controls on measures of drinking behaviour, motivation for drinking and its perceived consequences. They were also intermediate between the other two groups on measures of responsibility, self-esteem, paranoid thinking and aggression.

Venardos (1975) compared a sample of drunken drivers with two groups of alcoholics (clinic inpatients and rehabilitation seeking alcoholics) and a group of average drivers stopped on the road. Data were obtained from the Albuqueque Alcohol Safety Action Programme (ASAP) records, arrest records, presentence reports, psychiatric interview reports, self-report questionnaires, intelligence tests and personality tests. The average age of the drunken drivers in this study was 33 years, somewhat older than the "typical" drunken driver. They were generally married for the first time and had a high school or slightly less than high school education. The majority were employed in an unskilled or semi-skilled job (57.6%). Fifty-six percent were arrested at the weekend, most between the hours of 10 pm and 1 am and 68.3% also had a careless or reckless driving charge.

When compared with the two alcoholic groups the drunken drivers were found to differ significantly and were younger, more likely to be married, and fewer times, and to be employed; that is, they appeared to be different populations on the basis of the

demographic measures. Similarly, when compared to the average drivers, the drunken drivers were more likely to be male, less educated, in a lower level occupation and alone in the automobile. While no difference appeared in employment status, the drunken drivers were less likely to be single but more likely to be divorced or separated, thus corroborating the existing profile of the drunken driver. Based on these findings, the drunken driver does not represent the average driver. Venardos (1975) was also able to differentiate between the problem and non-problem drinkers in the drunken driver sample. Those with a drinking problem tended to have a higher BAL at the time of arrest, have poorer health, an older car and more prior driving and drunk arrests. Weekday arrests were also associated with problem drinking. The obtained significant differences between the drunken drivers and the two control groups were maintained when the control groups were compared with only the drunken driver problem drinkers. This finding lends support to the contention that

> "... while DWI (driving while intoxicated) problem drinkers have by definition a drinking problem, they as a group, can still be differentiated from the alcoholics who seek either in or outpatient rehabilitation services."
>
> (Venardos, 1975, p. 154.)

The psychiatric diagnosis revealed that 8.8% of the drunken drivers had no mental disorder, 24.4% could be classified as having a personality disorder, passive-aggressive, and 32.7% had a personality disorder, trait (non passive-aggressive).

These findings have particular implications for rehabilitation programmes aimed at this group. In particular, the finding of this study and those of Hurst (1979); Perrine (1970), and Selzer,

Vinokur and Wilson (1977) that drunken drivers generally drink beer significantly more often and in larger amounts than the rest of the population further suggests that although not necessarily alcoholic, the drunken driver requires some assessment and treatment for his drinking habits. Thus any programme aimed at this group could do well to incorporate some tactics aimed at reducing the amount of heavy drinking that goes on. Furthermore, the finding that drunken drivers differ on a diversity of attitudinal and personality measures from a group of controls implies that they are a special subgroup of the population and such programmes should be tailored to their specific needs.

Summary.

The demographic and personality characteristics of drunken drivers as compared with the general driving population can be summarized as follows:

a) The majority of drunken drivers are male.

b) Most are under the age of 25.

c) They have a higher incidence of marital separation and divorce.

d) The majority are employed in skilled, semi-skilled or unskilled positions.

e) They tend to belong to the lower socio-economic classes.

f) They have been found to differ on a number of personality measures such as responsibility, self-esteem and depression.

g) When compared with the general drinking population, drunken drivers have been found to differ in drinking behaviour. That is, they are more likely to:

1) drink beer in preference to other types of alcohol,

2) drink more alcohol on each drinking occasion,

3) have been drinking in a hotel,

4) have started regular drinking before the age of 17 years,

5) report that they are drinking more than they are happy with,

6) drink more for tension relief and relaxation.

CHAPTER 2

AIMS OF THIS INVESTIGATION

2.1 INTRODUCTION

The basic question underlying most of the research being conducted with drunken drivers concerns the extent to which this group can be considered to be a random sample of the general population. A review of the literature to date clearly indicates that this group can be differentiated from the rest of the population on a number of demographic variables and drinking measures. There is however, very little information regarding the personality characteristics of this group. While it is generally conceded that not everyone will attempt to drive after an excessive drinking bout, little is known about the type of person who does.

2.2 GENERAL AIMS

The purpose of this study is to investigate the personality characteristics of drunken drivers in order to determine whether or not there are any particular traits that appear to be more prevalent among this group. Studies of other deviant groups using various editions of the Eysenck personality measures have indicated the following differences:

(i) Prisoners score significantly higher on measures of "neuroticism" (Black and Gregson, 1973; Eysenck and Eysenck, 1971) and "psychotism" (Eysenck and Eysenck, 1971) than a group of matched control subjects.

(ii) Criminals who committed offences under the influence of alcohol have been found to have significantly higher "neuroticism" scores than those who were sober. This difference was not due to the differential involvement of alcohol in different types of offences as no association between alcohol and type of offence could be found (Jorm, 1977).

(iii) Drug users were found to score significantly higher on the "psychoticism" scale than comparison groups. Three of the four drug groups also scored higher on measures of "neuroticism". (Teasdale, Segraves, Zacune, 1971).

(iv) Excessive drinkers presenting themselves at a clinic for the first time were found to have excessively high mean "neuroticism" scores (Orford, 1976).

Of particular interest in this study is whether drunken drivers will also be elevated on these scales and thus have a similar profile to that of criminals and drug users.

Also investigated in this study is the degree to which drunken drivers consider that they have a purpose in life, a variable that has been found to be inversely related to depression (Crumbaugh, 1968, p. 14).

As mentioned above (see Section 1.4), Selzer, Vinokur and Wilson (1977) have found drunken drivers to be significantly more depressed than a group of controls. The measure used in the present study, the Purpose in Life Test (PIL), developed by Crumbaugh and Maholick (1964), is therefore expected to provide a measure of the degree to which the subjects feel depressed and feel that their life has no meaning.

Although there is no study to date that has administered this test to drunken drivers, it has been found to discriminate between deviant groups.

Strom and Tranel (1967) compared 54 male alcoholics in treatment with a control group of 98 hospital employees on the Purpose in Life Test and Allport- Vernon-Lindzey Study of Values. They found a large and consistent difference between the two groups on the PIL test, with no overlap on any of the items. A more detailed item analysis of the test indicated that the alcoholics reported more boredom, suicidal thinking and less goal directedness than the control group. The Allport-Vernon-Lindzey Study of Values did not differentiate between the two groups as clearly. Jacobson, Ritter and Mueller (1977) also studied this attitude in a group of 57 alcoholic patients in treatment soon after admission and shortly before discharge. They found that most of the patients indicated scores in the indecisive range (92-112) on the PIL test, and all showed a significant increase in score between the first and second test administrations. The authors tentatively concluded that while hospitalized alcoholics expressed neither a clear purpose in life or lack of it, comprehensive rehabilitation programmes may facilitate an increase in this attitude.

Similarly, drug users (Padelford, 1974) and recidivists (Black and Gregson, 1973) have been found to report little purpose in life.

Thus the general aim of this study is to investigate personality characteristics among drunken drivers that are likely to differentiate them from the population in general.

2.3 SPECIFIC AIMS

In this study three groups of subjects are compared on the Michigan Alcoholism Screening Test (MAST), the three scales of the Eysenck Personality Questionnaire (EPQ), Neuroticism (N), Psychoticism (P) and Extraversion (E), and the Purpose in Life Test (PIL). More specifically, a group of drunken drivers are compared with a group of alcoholics in treatment and a non-alcoholic control group. It is expected that these measures will discriminate predictably between the three groups.

Of special interest is whether the drunken drivers will resemble the alcoholics in the study on the personality measures and on the alcohol-related problem areas as indicated on the MAST. The extent to which these groups resemble each other has definite implications for the treatment and rehabilitation of those who drink and drive.

The specific aims of this study, therefore, are to investigate the degree to which drunken drivers differ from both alcoholics and normal controls on measures of drinking behaviour, P, E, and N, and purpose in life.

2.4 HYPOTHESES

It is hypothesised that both alcoholics and drunken drivers

1. have more alcohol-related problems as indicated on the MAST than "normals"; furthermore the difference is greater for alcoholics.
2. have less "purpose in life" than "normals"; furthermore the difference is greater for alcoholics.

3. are characterized by greater "extraversion" than "normals"; furthermore the difference is greater for alcoholics.

4. exhibit more "neuroticism" or "anxiety" than "normals"; furthermore the difference is greater for alcoholics.

5. exhibit more "psychopathy" (see Section 3.3) than "normals"; furthermore the difference is greater for alcoholics.

CHAPTER 3

RESEARCH DESIGN

3.1 SUBJECTS

The subjects participating in this study were 57 European males aged 35 or younger who were divided equally into three groups.

The experimental group (E) consisted of 19 men who had within the previous 18-month period, received a conviction for driving with a blood alcohol level in excess of the legal limit (80 mg/100 ml). As a result of such a conviction, five of the subjects had received a term of probation with the Christchurch Probation Department, six had received a similar term with the Blenheim Probation Department, two had been placed in a Residential Periodic Detention Centre, and one had been required to attend the Non-Residential Periodic Detention Centre. The remaining five subjects had received a combination of fines, community work, licence suspension and prohibition orders.

All subjects were volunteers and were approached personally regarding participation in the study. Of the men approached through the Christchurch Probation Department and Non-Residential Detention Centre, approximately two thirds agreed to take part in the study. However, all of those approached through the Residential Periodic Detention Centres and the Blenheim Probation Department consented to participate. Thus it is acknowledged that there may be a strong self-selective component within this sample and one cannot be sure of the extent to which it is representative of those persons recently convicted for drunken driving.

The first control group (C1) consisted of 19 men who had never received a conviction for driving with an excess blood alcohol level and who had never sought treatment for a drinking problem. Some of these subjects were employees of a major Christchurch motor-cycle firm (n = 8) while the majority (n = 11) were third year psychology students enrolled at Canterbury University.

For the purposes of this study, students were considered to constitute a fair comparison sample as the major demographic factors differentiating this group from the experimental group were those of intelligence and years of education, neither of which have been found to significantly influence test scores on the EPQ (Manual of the EPQ, p. 35) or PIL (Crumbaugh, 1968, p. 19). All of the men approached for inclusion in this sample were willing to participate.

The second control group (C2) consisted of 19 men with a recognized alcohol problem but who had never been convicted for a drunken driving offence. They were selected on this basis from all patients admitted to Queen Mary Hospital, Hanmer, between 1 June 1979 and 1 October 1979. Of the patients requested to participate in the study, only two declined to do so.

Thus the major variables being manipulated between the three subject groups are considered to be those of drinking behaviour and drunken driving convictions.

The three groups were successfully matched for sex, age and race. As regards education, groups E and C2 were matched with respect to the number of years spent at secondary school and the level of academic attainment. Group C1, however, had spent significantly longer at school ($t = 4.07$, $p < .001$) and in general had attained a higher level of education.

Groups E and C2 were also matched as regards the proportion of blue-collar/manual workers in each group and also on the occupational prestige rankings. The subjects in group C1, currently in employment, scored somewhat higher on these scales although the large number of students in the group made the assessment of social status difficult.

The fact that the three groups were not uniformly matched for education and socio-economic status is not expected to influence the results as performance on the tests employed in the study have been found to be unrelated to these variables (see Section 3.3).

No attempt was made to match the groups on level of intelligence or marital status as these variables were not considered to bear any significant relationship to the personality variables under investigation.

3.2 SAMPLING PROBLEMS

It was the original intention of the author to match all groups closely for sex, age, years of education and occupation. The rationale for this feature of the design was an attempt to eliminate as many extraneous variables as possible that could potentially influence the subjects' scores. Unfortunately, as initially set down, the constricted age range (20-29 years) and tighter criterion for inclusion in the samples meant that suitable subjects, particularly for the experimental group, were not readily available. In conjunction with this were difficulties inherent in trying to make contact with probationers while at the same time attempting to maintain anonymity and confidentiality should they decline to participate. Through necessity, the selection criteria were subsequently revised and expanded. The age range was

extended to include all those under the age of 35, and the specifications for the experimental group regarding previous arrest records were abolished. As a result, the samples became more heterogeneous and therefore less likely to be matched on these variables.

3.3 APPARATUS

For the purposes of this study, as outlined in Chapter 2, two measures were required. Firstly, a direct scale for the measurement of problem drinking or alcoholism, and secondly a measure of certain personality characteristics.

In selecting the tests for inclusion in the study, it was necessary that they meet the four following requirements. That is, the test or questionnaire must be:

(i) clearly written and easily understood by most people,

(ii) simply phrased,

(iii) amenable to the group testing situation,

(iv) as brief as possible, i.e. it must, on the average, take no longer than thirty minutes to complete.

The Michigan Alcoholism Screening Test (MAST).

The MAST was chosen as the screening instrument for problem drinking in this study. It was devised by Selzer (1971)

> "... to provide a consistent, quantitative, structured interview instrument for the detection of alcoholism that could be rapidly administered by non-professional as well as professional personnel." (p. 90)

This 25 item self-report questionnaire fulfilled all the requirements specified above, and in addition was easily scored

by totalling the different weightings for responses to the various questions (see Appendix A). Furthermore, several empirical studies have found this test to be useful for the diagnosis of alcoholism.

In an attempt to validate the questionnaire (Selzer, 1971), it was given to five groups of subjects: hospitalized alcoholics, a control group, drivers convicted of driving under the influence of alcohol, persons convicted of drunk and disorderly behaviour, and drivers who had incurred 12 penalty points in two years for moving violations and accidents. The validity of the MAST was assessed by searching the records of legal, social and medical agencies and reviewing the subjects' driving and criminal records. A validation score for each subject was derived from the drinking-related data obtained from this information. A cut-off score of 5 or more points was considered to denote alcoholism. A total of 15 subjects who scored in the non-alcoholic range when given the MAST were subsequently found to be alcoholic by virtue of a validation score of 5 or more points. Many of this false negative group were found to be alcoholic because of records that showed an undisclosed arrest for drunken driving or drunk and disorderly behaviour. Hence it was suggested that for maximum screening effectiveness and for overcoming the inaccuracy of alcoholics' responses regarding degrees of inebriety, the MAST and arrest records be used together. However, in a previous study quoted by Selzer (1971), 99 hospitalized alcoholics were given the MAST and instructed to lie about their drinking problems. Even so, 92 of these patients were able to be identified as alcoholics using a criterion level of five or more points.

Selzer, Vanosdall and Chapman (1971) tested the effectiveness of the MAST in revealing alcoholism in a problem driver group as it is recognized that a substantial proportion of such persons are likely to have alcohol problems, particularly those with known drunkenness offences. A total of 838 problem drivers summoned for "driver improvement interviews" were tested by six trained interviewers. The MAST scores for the entire driver group revealed that 14% were alcoholic using a 5 point and higher score as a criterion. However, when the scores for those drivers who had previous convictions for driving under the influence of alcohol and/or drunk and disorderly behaviour (209) were analysed separately, 42% had scores in the alcoholic range. Unfortunately, no attempts were made to validate this diagnosis.

Given that previous research indicates that up to 50% of such a group could have alcohol problems however, it does suggest that this test is sensitive enough to be used for detecting alcoholism in a problem driver population.

Lastly, in order to assess the internal consistency of this questionnaire, Zung and Charalampous (1975) caried out an item analysis of the MAST responses of two groups of 100 drunken drivers. Based on a MAST score of 5 points or more, 68% of the first sample and 56% of the second sample were able to be classified as problem drinkers. That is, at least a half of the drunken drivers could be considered to show evidence of a drinking problem.

The discriminative capacity of the test items was assessed in terms of their ability to distinguish between MAST defined

problem drinkers (a score of 5 or more) and adjustive drinkers (a score of 4 or less). Overall, most test items discriminated adequately between problem drinkers and adjustive drinkers, supporting the internal validity of the MAST. Furthermore, most items showed a moderate or high degree of correlation with the total test score as evidence of the internal consistency of the test. Those items producing low correlations with the overall score were those denoting certain specific alcohol-related habits and effects, e.g. fights after drinking (item 10), morning drinking (item 17), delirium tremens (item 19), help seeking for emotional problems (item 23) and arrests for drunkenness (item 24).

On these grounds the MAST was considered to be an appropriate measure for use in this study, and likely to detect any problem drinkers amongst the drunken driver sample.

The MAST was scored according to the weightings suggested by Selzer (see Appendix A). However affirmative responses to items 24 and 25, pertaining to alcohol-related arrests, were given two points only (as opposed to two points per arrest) due to the inaccessibility of the prior arrest records.

The Eysenck Personality Questionnaire (EPQ)

Although many writers have suggested the existence of an "alcoholic personality" or an "addictive personality", the research to date has failed to substantiate any such claims.

The purpose of this study is not to isolate any unique characteristics of the alcoholic but to determine the possible existence of certain general traits which appear to be more prevalent among drunken driver/problem drinker groups as

compared with the general population. Although the most consistent research in this area has been conducted using the Minnesotta Multiphasic Personality Inventory (MMPI), the length of this test made it unsuitable for the present purpose. The Eysenck Personality Questionnaire (EPQ) was subsequently selected for use in this study, firstly due to the frequency with which previous forms of this test have been used in studies conducted with deviant groups, and secondly because it seemed to best fit the test requirements specified above.

This 90 item questionnaire, developed from the Eysenck Personality Inventory (EPI) contains three scales, each measuring a different dimension of personality. The main feature of this edition of the test is the addition of a new Psychoticism (P) scale to the already existing Neuroticism (N) and Extraversion (E) scales. The E and N scales of the EPQ are reported to differ little from those in the previous forms of this test (although no evidence is supplied in the manual to support this) and therefore they will not be discussed at length due to the fact that they are generally well known and accepted.

Briefly, the E scale can be said to measure the variables of sociability, impulsivity, optimism, aggression, reliability and a carefree attitude, although the version presented in the EPQ is thought to emphasize the sociability component and to de-emphasize impulsivity compared with previous scales (Buros, 1978). The N scale is reported to measure anxiety, moodiness, depression, and emotional reactivity.

Compared with the E and N scales of the Eysenck personality measures, few experimental studies have been conducted using the

P scale. Furthermore, the Eysencks' claim that this scale can be considered to be a measure of a genetically based psychotic predisposition in normals has been the focus of much discussion and dispute. The EPQ manual describes a high scorer on the P scale as possibly solitary, uncaring, troublesome, cruel, inhumane, hostile, aggressive, insensitive and lacking in feeling and empathy.

> "In psychiatric terms, the concept of 'psychoticism' is thought to best describe 'schizoid' and 'psychopathic' behaviour patterns."
> (Manual of the EPQ, p. 11.)

The concept of P as a "psychoticism" dimension was initially supported by the finding that psychotics obtain significantly higher scores on this scale than neurotics or controls, and that there appears to be an increase in P with increases in the severity of the symptoms defining the psychosis (Eysenck and Eysenck, 1976; Verma and Eysenck, 1973). In view of this, Eysenck and Eysenck (1976) concluded that

> "... these findings seem to justify the labelling of the factor as one of psychoticism." (p. ix)

Contrary to this view however, Kendell (1975) reached the conclusion that

> "... the available evidence does not warrant its identification as a measure of psychosis, actual or potential." (p. 127).

The fact that groups of criminals (Eysenck and Eysenck, 1970, 1971) and drug users (Teasdale, Segraves and Zacune, 1971) score as highly on P as persons with acute psychoses suggests that Psychoticism may be a misleading title for this trait. Furthermore, Eysenck and Eysenck (1972) concede that it may be more appropriate to consider this scale to measure behaviour more characteristic of psychopaths than of psychotics.

A principal components' analysis of the first version of the P scale in the PEN Inventory lent considerable support to the hypothesis that a major component of Psychoticism was one related to hostility (Forbes, 1973). Furthermore, it was found to be strongly associated with Neuroticism.

Davies (1974) administered the PEN P scale along with the N, E and L scales and scales derived from the MMPI to a group of 103 patients in a hospital for abnormal offenders. He found that the P scale was not consistently independent of the N and E scales and furthermore did not discriminate between psychotic and non-psychotic offenders. A factor analysis of the items indicated that this scale appeared to be

> "... a measure of the tendency to evaluate oneself and others in a negative manner." (p. 165)

and was also highly correlated with a factor generally called Emotionality.

In the most recent edition of this scale, that presented in the EPQ and used in this study, the items have been reviewed in an attempt to create a scale completely independent of both Neuroticism and Extraversion.

In a principal components' analysis of this test, Forbes (1976) found the P scale to be unrelated to hostility[a] and empathy and to be correlated most highly with "Respect for the Law" and the four other variables that together comprise the Conformity Scale of the Comrey Personality Scales. This P scale was also found to have

> "... a greater degree of uniqueness than was found in its earlier version of the PEN." (p. 34)

That is, almost a half of the differentiation afforded was unique to the P scale.

[a] As measured by the Comrey Personality Scales.

Clinical studies using the scales of the PEN Inventory and EPQ indicate high P scores among groups of psychiatric patients, drug users, criminals and possibly alcoholics (Shaw, MacSweeney, Johnson and Merry, 1975). While Eysenck and Eysenck (1976) believe this supports

> "... the concept of P as a psychoticism dimension (with psychopathology as a half-way stage towards psychosis)" (p. 203)

it could also be argued that Psychoticism is an inappropriate label for the P scale due to its strong association with a diversity of deviant groups, many of whom will probably never develop the symptoms of psychosis.

For the purposes of this study, the author considers it more appropriate to view this scale as one measuring a possible predisposition towards deviancy or psychopathy, as opposed to psychosis and it will therefore be referred to as such for the remainder of the discussion.

The EPQ manual reports the test-retest reliabilities of the scales as ranging from .78 (P) to .89 (E) with the internal consistency reliabilities (the degree to which the questions in the scale cover a given area) ranging from .68 to .88.

The standardization data for the EPQ, based on 2,312 males and 3,262 females (reported in more detail in the manual, p. 17) indicates large sex and age differences on all scales, with scores decreasing with age. For both the P and N scales, the females score consistently lower than the males in each age group. This trend is also found in the E scale data up to the age of 50 whereafter the trend is reversed. A sex x age x social class analysis (Manual of the EPQ, p. 22) revealed no age x social class interaction effects

and no relationship between social class and scores on the E and N scales. Although the trends for P were not found to be statistically significant for either sex, the two working class groups (skilled working class and semi-skilled/unskilled working class) are regarded as having a score generally one point higher than the middle class groups both for men and for women.

A fourth scale included in the EPQ is the L or lie scale which is designed to measure a tendency on the part of some subjects to "fake good". The L scale is also thought to measure some stable personality factor

> "... which may possibly denote some degree of social naivete."
>
> (Manual of the EPQ, p. 14.)

or a need for social approval (Buros, 1978, p. 812), although very little is really known about it. Eysenck and Eysenck state in the manual that under conditions in which there is little motivation to dissimulate, the L scale measure should not be used for this purpose and can therefore

> "... be used as a measure of whatever personality function is being measured by the scale." (p. 15)

The lie scale scores are reported to increase rapidly with increasing age, with women indicating higher scores than men. A significant linear trend is also indicated between L scores and social class. For more information on the standardization data for these scales the reader is referred to the Manual of the Eysenck Personality Questionnaire (1975, pp 17-26).

The Purpose in Life Test (PIL)

The Purpose in Life Test (PIL)[a] is a scale designed to measure the degree to which an individual experiences a sense

[a] See Appendix B

of meaning and purpose in life. For the purposes of this study only Part A of the test was used, consisting of 20 items to be rated on a 7 point scale. In each case position 4 is defined as neutral. The total score for each individual was obtained by totalling all scale points selected by the subject with higher scores indicating a higher degree of meaning and purpose in life.

The PIL has been found to correlate with the Crowne-Marlowe Social Desirability Scale (.57), the Scrole Amonia Scale (.34) and the MMPI Depression Scale (-.68), although

> "... the marked differences in content of most items on each scale from that of items on the other suggests that the two measures are not identical."
>
> (Crumbaugh, 1968, p. 14.)

Crumbaugh (1968) goes on to suggest that the PIL actually measures a further aspect of depression that is important to treatment but has previously been neglected.

Reker (1979) also found significant correlations between the PIL and semantic differential ratings on the concepts Life at Present and Life in the Future, with a tendency for the PIL to be related inversely to Present-Future Life discrepancy scores.

The split-half reliability of the test is high (.92) and the

> "... validity of the PIL as a measure of Frankl's 'existential vacuum' (loss of a sense of meaning and purpose in life) seems sufficiently well established in the present and earlier study for reliable use as a group indicator."
>
> (Crumbaugh, 1968, p. 11.)

Reker (1979) also found strong support for both the factorial and construct validity of the test.

The PIL has been found to be unrelated to sex of the subject (Crumbaugh, 1968; Reker, 1979), education and income (Crumbaugh,

1968). Data regarding the relationship between the PIL scores and age of subject are however, less conclusive.

3.4 PROCEDURE

All participants in the study were asked if they would be willing to take part in a study comparing drunken drivers with those who have never been convicted for this offence. The aim of the study was then outlined to the participants; briefly, that it was an attempt to determine if there were any general characteristics that appeared to differentiate between persons who had been convicted for drunken driving and those who had not.

All subjects in group E were individually questioned and tested by the author either in their own homes or in a private room in the Probation Department. Those subjects in the two control groups were group tested by the author at the workplace, university or hospital, whichever one was applicable, due to time constraints and practical necessity.

All questionnaires used in the study were of the paper and pencil type and each was accompanied by specific instructions for completion. For group E only, the demographic data were obtained through direct questioning of the subject by the author in order to ensure precise and complete data, necessary for the construction of a profile of the drunken driver.

Only one subject in the study (group E), required all questions to be read aloud due to reading difficulties.

At the beginning of the testing session, all subjects were asked their age, marital status, years of education and level attained, details of any occupational training they had received

and their present occupation. They were then given the Michigan Alcoholism Screening Test, the Purpose in Life test and the Eysenck Personality Questionnaire and asked to complete them in that order.

The subjects were required to read the instructions printed on the forms and to then fill them out at their own speed. If any problems were encountered regarding what was required, or with reference to the interpretation of a particular question, the subjects were encouraged to request assistance from the author.

The subjects were not required to put their names on any of the forms and were repeatedly assured that personal identity, information and individual test scores were confidential. Each set of questionnaires was numbered for each subject so as to enable them to be kept together and for ease in handling the data.

CHAPTER 4

RESULTS

With respect to the demographic characteristics of the three groups studied, the alcoholics and drunken drivers were more likely to have been married than the normal controls, although over a quarter of the drunken drivers were separated or divorced (see Table 4).

The educational background of the subjects is summarized in Table 5. The mean number of years spent at secondary school for the alcoholics, drunken drivers and normal controls was 3.15 years, 3.24 years and 4.61 years respectively, the normal control group having spent significantly more years at school than the other subjects ($p < .001$). Furthermore, 58% of the alcoholics, 68% of the drunken drivers and 68% of the normal controls had received further training subsequent to leaving secondary school. In the case of the alcoholics and drunken drivers this was generally a period of formal occupational training or a trade apprenticeship whereas the normal controls were more likely to have attended a tertiary education institution.

On the basis of their occupation at the time of the interview, the subjects were classified according to occupational status and socio-economic class using the Occupational Prestige Ranking Scale for New Zealand compiled by Davis (1974). The occupational prestige rankings are presented in Table 6, indicating that all of the alcoholics in employment, 88% of the drunken drivers in employment and 54% of the normal controls had a lower ranking of 5, 6 or 7.

TABLE 4: Marital Status of Subjects

Marital Status	Alcoholics (n = 19)	Drunken drivers (n = 19)	Normals (n = 19)
Single	11	10	15
Married	5	4	2
Divorced	2	2	0
Separated	1	3	2

TABLE 5: Educational Background of Subjects.

	Alcoholics (n = 19)	Drunken drivers (n = 19)	Normals (n = 19)
Average number of years spent at Secondary School	3.15	3.24	4.61
t		4.07	
Significance		p < .001	
Level attained			
Forms 3, 4	5	6	1
Forms 5, 6, 7	14	13	18
Formal Occupational Training	11	9	1
Tertiary Education	-	4	12

TABLE 6: Occupational Prestige Ranking of Subjects (Davis, 1974).

Rank	Alcoholics (n =19)	Drunken drivers (n = 19)	Normals (n = 19)
1		1	
2		1	
3			2
4		1	4
5	5	4	6
6	9	3	1
7	2	7	
Students		3	6
Unemployed	3		

When grouped according to socio-economic class (see Table 7), 68% of alcoholics, 74% of drunken drivers and 11% of normal controls were blue-collar or manual workers.

The scores on the two personality tests, the PIL test and the EPQ, and the MAST, for all subjects, were analyzed in two stages.

a) A stepwise discriminant analysis was performed to assess the discriminating effect of the EPQ between subjects.

b) A multivariate analysis of variance (MANOVA) was then used to check for differences between the three groups in terms of the MAST and PIL test scores in addition to the EPQ scores.

a) Stepwise Discriminant Analysis of the EPQ Scores.

For this analysis the critical value of $\underline{F}$ (2, 18) at the .05 level of significance is 3.55. On this basis only the N scale of the EPQ discriminates between the three groups although the L scale is almost significant (see Table 8). The L scale does produce a significant discriminating effect however ($\underline{p} < .014$), if the effect of the N scale is not first removed (see Table 10 of the MANOVA results).

Table 9 shows the classification of the subjects on the basis of the first discriminant function. Only 56% of the subjects are correctly allocated to their prior groups indicating that this function is not adequately distinguishing between the three groups, considering that discriminant analysis capitalizes on chance variation within a particular set of data. This is clearly illustrated in Figure 1 which shows the distribution of the subjects on the first two canonical

TABLE 7: Socio-Economic Classification of Subjects (Davis, 1974).

Class[a]	Alcoholics (n = 19)	Drunken drivers (n = 19)	Controls (n = 19)
I		1	3
II			4
III			1
IV	3	1	3
V	8	4	2
VI	3	2	
VII	2	8	

[a] The classes can be divided into three broad categories:

White Collar/Non-Manual (I, II, III)

Intermediate (IV)

Blue Collar/Manual (V, VI, VII)

TABLE 8: Summary Table of the Stepwise Discriminant Analysis on the Eysenck Personality Questionnaire Scores

Step Number	Variable Entered[a]	F Value to Enter or Remove[b]	Number of Variables Included	U-Statistic
1	3	10.6226	1	0.7177
2	4	3.3363	2	0.6374
3	2	1.6349	3	0.5997
4	1	0.4664	4	0.5889

[a] The variables were coded as follows:

1 P scale scores

2 E scale scores

3 N scale scores

4 L scale scores

[b] $F_{.05}(2, 18) = 3.55$

TABLE 9: Numer of Cases Classified into Groups by the Eysenck Personality Questionnaire Scores.

Prior Group	Posterior Group		
	Alcoholics	Drunken drivers	Normals
Alcoholics	13	1	5
Drunken drivers	2	10	7
Normal controls	4	6	9

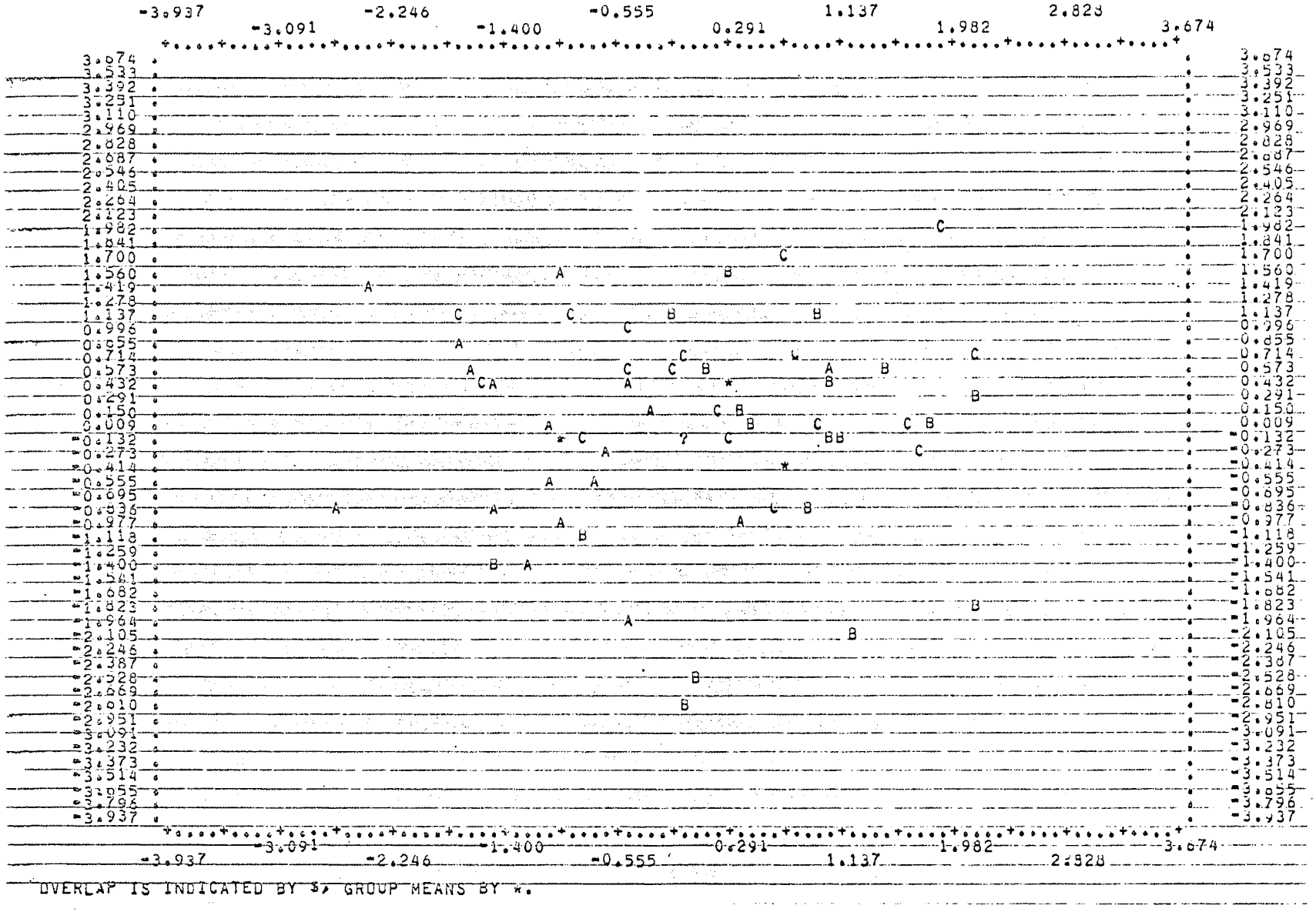

FIGURE 1: Distribution of Subjects on the First Two Canonical Variables of the Stepwise Discriminant Analysis.

variables. It can be seen in this figure that there is no clear grouping of the subjects and that the group means (indicated by asterisks) are closely spaced.

To summarize these results, the discriminant analysis of the EPQ scores indicates that the three groups of subjects are sufficiently different in terms of their scores on the N scale of the EPQ, but this difference is not sharp enough to allow one to predict group membership solely on the basis of these scores.

b) Multivariate Analysis of Variance.

The first MANOVA was performed on the four scales of the EPQ for the three groups of subjects. Significant differences were found between the EPQ scores across the three groups using Wilk's Lambda as the criterion for significance. Table 10 indicates that it is the N ($p < .001$) and L ($p < .014$) scales of the EPQ which are most sensitive to the group differences. The means and standard deviations for each scale given by each of the three groups are presented in Table 11. A two-sample t-test for unrelated measures revealed that the only significant differences between the three groups are on measures of N and L as indicated by the MANOVA. More specifically, the alcoholics scored significantly higher on the N scale than either the drunken drivers ($p < .001$) or the normals ($p < .005$), while the drunken drivers scored significantly higher on measures of L than the normals ($p < .01$). No other differences between the groups were found.

A second MANOVA was run using the scores on the MAST and the PIL test. As shown in Table 12, there was a significant overall effect on both sets of scores ($p < .001$). As expected, the

TABLE 10: Univariate F Tests for the Four Scales of the Eysenck Personality Questionnaire.

Scale	F (2, 54)	p less than
P	0.928	.401
E	0.387	.681
N	15.644	.001
L	4.612	.014

TABLE 11: Group Means and Standard Deviations for the Four Scales of the Eysenck Personality Questionnaire.

EPQ Scale	Alcoholics (n = 19)	Drunken drivers (n = 19)	Normals (n = 19)
Psychoticism			
Mean	6.26	4.68	5.05
SD	4.96	2.52	2.99
Extraversion			
Mean	12.47	13.16	14.05
SD	5.04	5.44	4.33
Neuroticism			
Mean	16.89	9.79	11.84
SD	4.28	4.64	5.65
t	4.77	-	
Significance	$p < .001^a$		
Lie			
Mean	4.95	6.74	3.74
SD	3.57	4.24	2.58
t	1.37	2.56	
Significance	$p < .1^a$	$p < .01^a$	

[a] denotes one-tailed test

TABLE 12: Univariate F Tests with the Scores of the Michigan Alcoholism Screening Test and the Purpose in Life Test.

	F (2, 54)	p less than
MAST	47.845	.001
PIL	7.549	.001

MAST distinguished between the three groups, it being specifically designed to measure drinking behaviour. Furthermore, the correlation between the MAST scores and the first discriminant function between the groups was .964, indicating that the MAST accounts for $.964^2$ of the discriminating effect between the subjects. The means and standard deviations for the three groups on the MAST and PIL test are presented in Table 13. A two-sample t-test for unrelated measures indicated that both alcoholics ($p < .001$) and drunken drivers ($p < .05$) scored significantly lower on the PIL test than did those in the normal control group. The MAST scores indicate that the drunken drivers are intermediate with regard to drinking behaviour and differ significantly from both alcoholics and normals ($p < .001$).

From the results outlined above, it appears that the MAST effectively discriminates between the three groups, each having different patterns of drinking behaviour. To a lesser extent the PIL test and N scale of the EPQ also distinguish between the different subject samples, the pattern being clearly illustrated in Figure 2.

Thus, providing that the researcher has the co-operation of the interviewee, the MAST appears to be the best way of diagnosing drinking behaviour. In some situations however, one may expect a certain degree of under-reporting of drinking behavior or faking. In such cases, the N scale of the EPQ may provide an indication as to the likely drinking pattern of the person concerned. Figure 3 shows the distribution of subjects on the basis of these two scores alone. The scattered group means (indicated by asterisks) suggest a certain amount of subject grouping, although it is clear from the

TABLE 13: Group Means and Standard Deviations for the Michigan Alcoholism Screening Test and the Purpose in Life Test.

	Alcoholics (n = 19)		Drunken drivers (n = 19)		Normals (n = 19)
PIL Test					
Mean	86.47		96.21		108.58
SD	22.08		18.26		10.29
t		1.4		2.51	
Significance		$p < .1$[a]		$p < .05$[a]	
MAST					
Mean	32.58		14.74		2.16
SD	9.53		13.54		2.04
t		4.57		3.89	
Significance		$p < .001$[a]		$p < .001$[a]	

[a] denotes one-tailed test

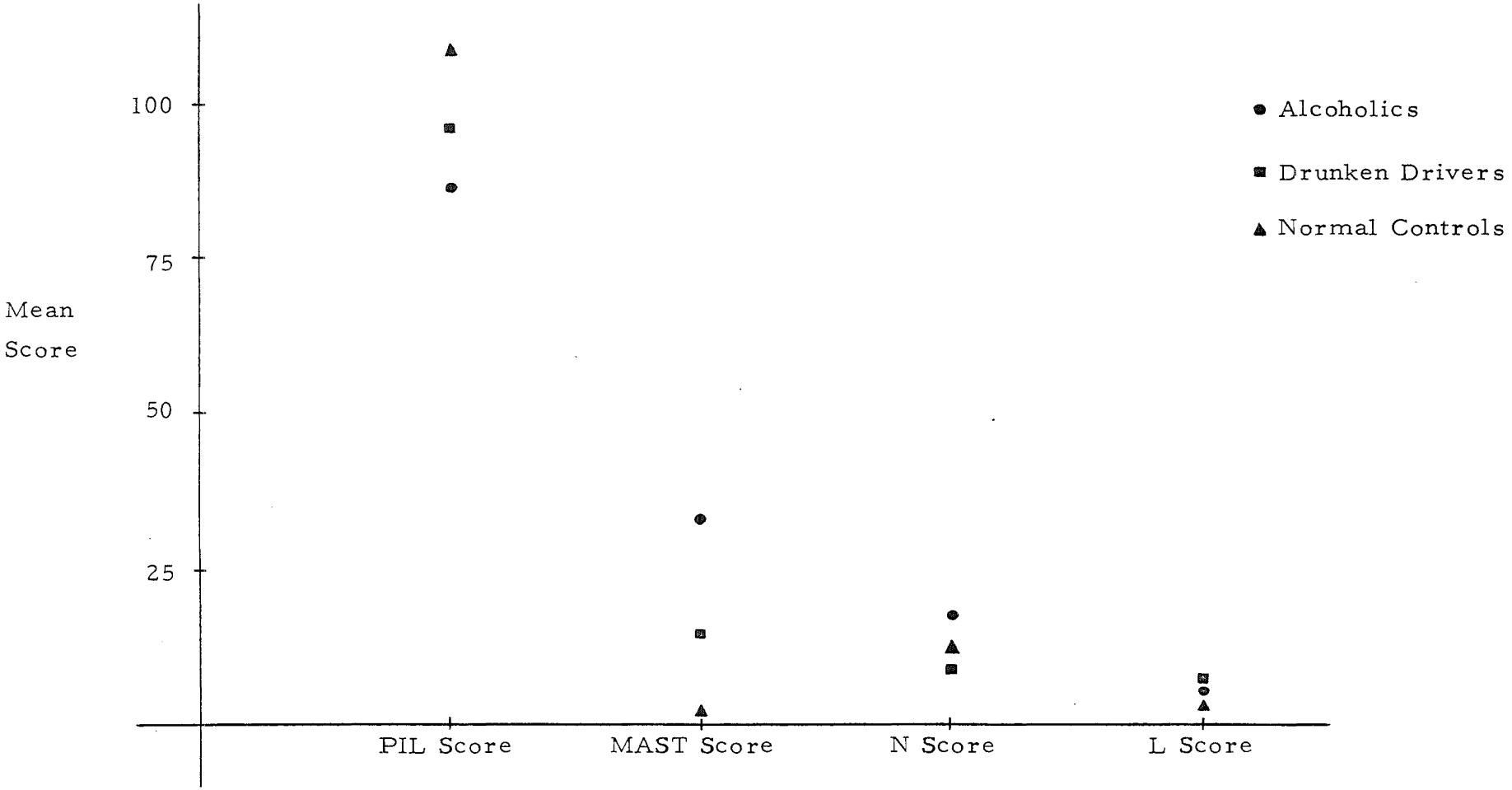

FIGURE 2: Group Mean Scores on the Purpose in Life Test, the Michigan Alcoholism Screening Test and the Eysenck Personality Questionnaire.

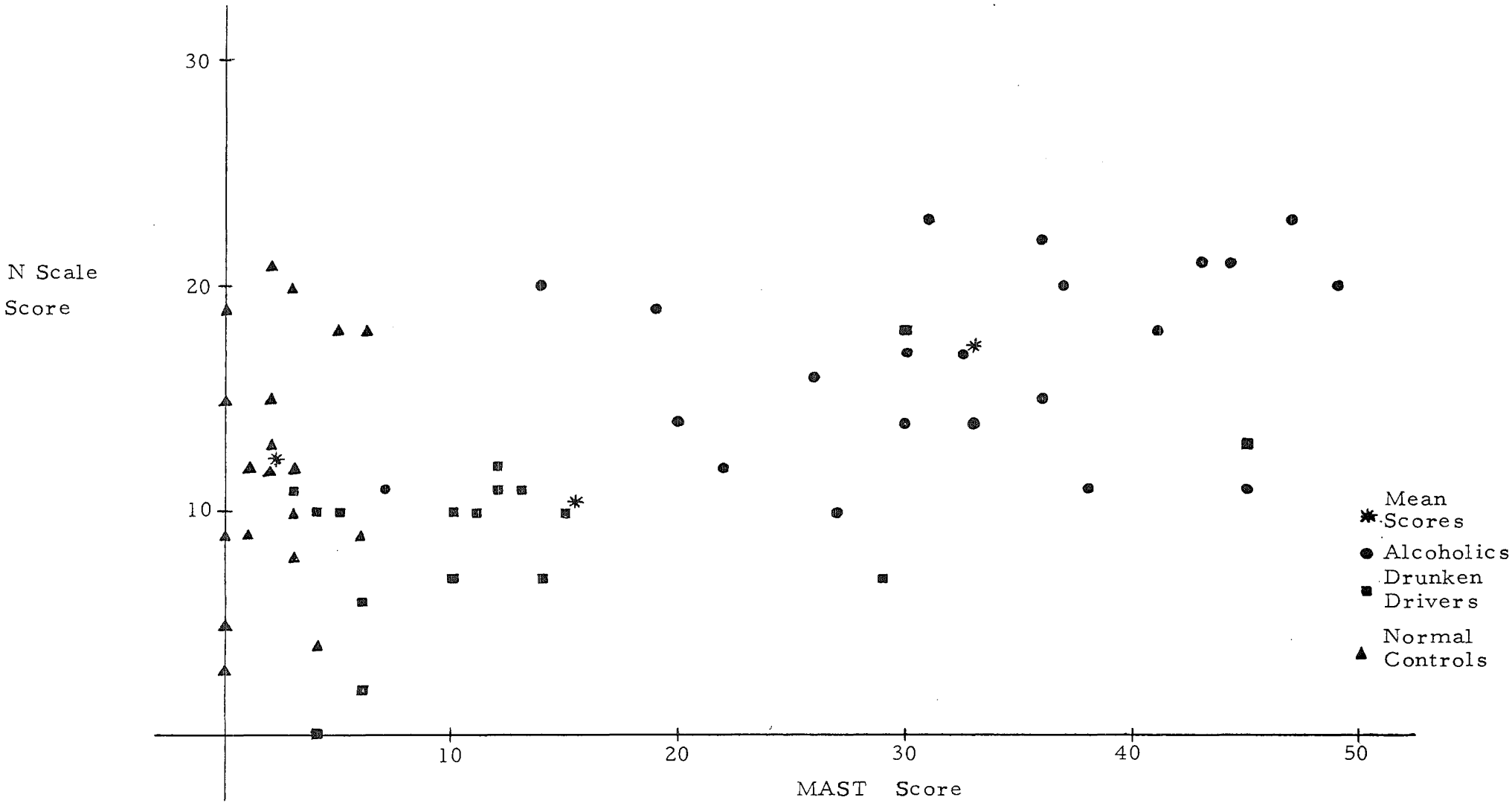

FIGURE 3: Distribution of Subjects According to Scores on the Michigan Alcoholism Screening Test and the N Scale of the Eysenck Personality Questionnaire.

scatter plot that there is a certain amount of dispersion of the group members across the range of scores. Furthermore, Table 14 indicates that the relationship between these two scores, while not very strong, is somewhat greater than that between any other pair of scores for this group of subjects.

As the MAST was specifically designed as an instrument for detecting drinking behaviours that possibly indicate alcoholism or problem drinking in individuals, the MAST scores were further analyzed in order to determine the numbers of subjects in each group who are possibly alcoholic. The criterion score of 5 points was used, above which an individual is classified as alcoholic. Table 15 shows the proportion of subjects in each group who fall into this category. As would be expected, all of the alcoholics in treatment had scores over 5 and thus were considered alcoholic on the basis of their performance on the MAST. Eighty-four percent of the drunken drivers and 16% of the normals can also be classified as such.

A question-by-question analysis of the MAST responses for each group of subjects (see Table 16) illustrates the pattern of drinking behaviour typical to each of the groups. Predictably, while the alcoholics replied in the affirmative to each of the alcohol-related problems referred to in the questionnaire, very few of the normal control subjects reported difficulties in these areas. Only 26% of the subjects in the normal control group reported difficulties with loss of memory (see question 2, Table 16), the major problem area for this group, compared with 74% of the drunken drivers and 100% of the alcoholics. The main problem areas for the drunken drivers are in their relationships with family

TABLE 14: Intercorrelations between the Michigan Alcoholism Screening Test, the Purpose in Life Test, and N and L Scales of the Eysenck Personality Questionnaire.

	MAST	PIL	N Scale	L Scale
MAST				
PIL	-.319			
N Scale	-.513	.359		
L Scale	.317	-.119	-.324	

TABLE 15: Proportion of Subjects Scoring Above and Below the Criterion Score on the Michigan Alcoholism Screening Test.

MAST Score	Alcoholics (n = 19)		Drunken drivers (n = 19)		Normals (n = 19)	
	N	%	N	%	N	%
⩾ 5	19	100	16	84.21	3	15.79
< 5	-	-	3	15.79	16	84.21

TABLE 16: Response to Individual Questions of the Michigan Alcoholism Screening Test.

Questions:	E		C1		C2	
	% Yes	% No	% Yes	% No	% Yes	% No
1. Do you ever feel you are a normal drinker (i. e. you drink as much or less than most people)?	73.68	26.32	100.0	-	21.05	78.95
2. Have you ever awakened in the morning after some drinking the night before and found that you could not remember a part of the evening before?	73.68	26.32	26.32	73.68	100.00	-
3. Does your wife (or parents) ever worry or complain about your drinking?	52.63	47.37	5.26	94.74	84.21	15.79
4. Can you stop drinking without a struggle after one or two drinks?	78.95	21.05	100.0	-	15.79	84.21
5. Do you ever feel bad about your drinking?	42.11	57.89	21.05	78.95	94.74	5.26
6. Do friends or relatives think you are a normal drinker?	63.16	36.84	89.47	10.53	47.37	52.63
7. Do you ever try to limit your drinking to certain times of the day or to certain places?	47.37	52.63	15.79	84.21	47.37	52.63
8. Are you always able to stop drinking when you want to?	78.95	21.05	94.74	5.26	15.79	84.21
9. Have you ever attended a meeting of the Alcoholics Anonymous (AA)?	10.53	89.47	10.52	89.47	73.68	26.32
10. Have you ever got into fights when drinking?	47.37	52.63	-	100.00	73.68	26.32
11. Has drinking ever created problems with you and your wife?	31.58	68.42	-	100.00	57.89	42.11
12. Has your wife (or any other family member) ever gone to anyone for help about your drinking?	10.53	89.47	-	100.00	31.58	68.42

	E		C1		C2	
	% Yes	% No	% Yes	% No	% Yes	% No
13. Have you ever lost friends, girlfriends/boyfriends because of drinking?	26.32	73.68	-	100.00	63.16	36.84
14. Have you ever got into trouble at work because of drinking?	21.05	78.95	-	100.00	78.95	21.05
15. Have you ever lost a job because of drinking?	10.53	89.47	-	100.00	52.63	47.37
16. Have you ever neglected your obligations, your family, or your work for two or more days in a row because you were drinking?	26.32	73.68	-	100.00	68.42	31.58
17. Do you ever drink before noon?	63.16	36.84	68.42	31.58	84.21	15.79
18. Have you ever been told that you have liver trouble?, cirrhosis?	-	100.00	-	100.00	15.79	84.21
19. Have you ever had delirium tremens (DT's), severe shaking, heard voices or seen things that weren't there after heavy drinking?	21.05	78.95	-	100.00	42.10	57.89
20. Have you ever gone to anyone for help about your drinking?	15.79	84.21	-	100.00	73.68	26.32
21. Have you ever been in hospital because of drinking?	21.05	78.95	-	100.00	57.89	42.11
22. Have you ever been a patient in a psychiatric hospital or on a psychiatric ward of a general hospital where drinking was a part of the problem?	15.79	84.21	-	100.00	42.11	57.89
23. Have you ever been seen at a psychiatric or mental health clinic, or gone to a doctor, social worker or clergyman with an emotional problem in which drinking had played a part?	15.79	84.21	-	100.00	43.37	52.63

	E		C1		C2	
	% Yes	% No	% Yes	% No	% Yes	% No
24. Have you ever been arrested, even for a few hours, because of drunk behaviour?	63.16	36.84	-	100.00	47.37	52.63
25. Have you ever been arrested for drunk driving or driving after drinking?	100.00	-	-	100.00	-	100.00

and friends and with respect to aggressive and disorderly behaviour whilst intoxicated. Fifty-three percent of this group reported that their wife or family complains about their drinking (question 3), 26% have lost friends or neglected their family because of drinking (questions 13 and 16), 32% reported that drinking has created problems with their wife (question 11), 47% have got into fights when drinking (question 10) and 63% have at some time been arrested for drunk behaviour (question 24). Furthermore, over 40% of the drunken drivers reported having at some time felt bad about their drinking (question 5) although only 16% had ever sought help for this problem (question 20).

CHAPTER 5

DISCUSSION

The sample of drunken drivers used in this study was found to be very similar to the typical drunken driver as discussed in Section 1.4 with regard to personal demographic characteristics. That is, they were generally married, with nearly 25% separated or divorced, of low occupational status and socio-economic level, and having had a secondary school level education. This profile of the convicted drunken driver has been consistent throughout the literature to date and suggests that this portion of the population is disproportionately represented among drivers who drink and drive. Furthermore, it is unlikely that this is due to discriminative selection by traffic officers as, in New Zealand at least, random breath testing of drivers is not yet permissible. In order to be stopped for this purpose, the officer must have a legitimate reason whether it be for a traffic violation or the suspect condition of the motor vehicle. One possible explanation could be that persons in the lower socio-economic classes may have older vehicles which are more likely to be in an unsatisfactory condition of fitness for driving. Bailey (1979b) however, did not find this to be so. A more likely explanation would seem to be one concerned with the drinking habits of young manual workers, particularly with respect to the drinking place and the distance travelled to reach it. As most drunken drivers appear to have had their last drink in a hotel (Hurst, 1979) and considering that 57% of all fatal accidents involving alcohol in 1977 occurred on the open road (Bailey, 1979b), it can be assumed that many such drivers are in the habit of travelling considerable distances to hotels in order to

do their drinking. Furthermore, if this does happen to be the case, they are more likely to be under the scrutiny of enforcement officers who tend to patrol the more heavily used roads and main highways where many intoxicated drivers would be detected due to excess speed.

Convicted drunken drivers have also been found to consume more alcohol on each drinking occasion than the general male population (Hurst, 1979), with most studies indicating at least 50% of such persons to have a serious drinking problem (see Section 1.3).

Of the drunken drivers interviewed in this study, 84% were considered to be alcoholics on the basis of the MAST score alone. Furthermore, the alcoholics in treatment had a more serious alcohol problem than the drunken drivers studied, who in turn had more alcohol problems than the normal control group. This suggests that the drunken drivers, while they can be classified as alcoholic on the basis of their MAST score, as yet are not experiencing the same degree of family and job disruption due to alcohol as the alcoholics in treatment. Hypothesis one is thus supported.

The most common alcohol-related problems for this group of drunken drivers are in the areas of personal relationships with family and friends; the tendency to become aggressive after consuming alcohol; and a high incidence of arrests due to drunken behaviour. A conviction for driving with an excess BAL is therefore likely, in many cases, to be an early indication of a drinking problem.

With regard to the personality characteristics of the three groups studied, few differences appeared. Partial support was found for hypotheses two and four regarding the PIL test and N scale respectively, while no support was found for hypotheses

three and five, concerning the E and P scales of the EPQ. Those in the normal control group found more purpose in their lives than either the alcoholics or drunken drivers who differed only marginally on this variable. This in turn suggests that the latter groups of subjects tend to experience more feelings of depression and meaninglessness, a common feature of persons with an alcohol problem.

In the case of the drunken drivers in this study, the responses to the MAST questionnaire in combination with the PIL scores add further support to the view that many drunken drivers are experiencing problems related to alcohol which warrant serious consideration. Furthermore, the alcoholics in treatment are significantly more anxious, moody and depressed as measured by the N scale than either the drunken drivers or controls, thus illustrating the progressive deterioration in the ability to cope with problems and stresses, often associated with chronic alcohol problems.

The lack of discrimination between the groups on the basis of the E and P scales of the EPQ could be the result of several factors. Firstly, although both criminals and drug users have been found to score higher on the P scale than controls, there may be differences between such persons and drunken drivers, who abuse alcohol, a socially sanctioned drug. While the criminal and drug user groups studied have knowingly committed an offence generally considered to be serious, driving with an excess BAL is only beginning to be viewed in the same light. Furthermore, many such drivers may not be able to discriminate effectively between various BAL's and thus may not be aware of the extent to which their driving is impaired. Secondly, the sample of drivers studied was small, and heterogeneous with

regard to the number, type and seriousness of the offence (traffic violation or accident) and the type of sentence delivered (fine, licence suspension or periodic detention). It is possible that a larger group of persons, each with several drunken driving convictions, may have produced a different result.

The finding that the drunken drivers are not more extraverted than the other groups as expected is possibly due to the fact that alcohol is used by many persons to counteract feelings of inferiority and to compensate for a lack in social skills. That is, many problem drinkers may in fact have a tendency to be introverted in certain social situations and have learned to cope through the effects of alcohol. Furthermore, the control group used in this study contained a high proportion of senior university students who by the fact that they have succeeded in an institution often necessitating a reduction in social activities, may be slightly more introverted than the general population. Any attempt to explain these results however, is purely speculation and can only be resolved through a more extensive study involving larger and more carefully sampled groups.

The results of this study are considered to support the contention that persons who consume excess amounts of alcohol before driving are not a random sample of the general driving population. Persons in this subgroup of the population tend, in general, to share similar educational and vocational experiences; they tend to differ in their alcohol consumption and drinking practices when compared with the general male drinking population, and they have somewhat more alcohol-related problems, especially with respect to family, friends and the law. As found by Selzer, Vinokur and Wilson (1977),

the drunken drivers are more like alcoholics than controls on most of the measures used, although there may be a tendency for them to be less extreme on many of the variables.

Despite the many common features of this segment of the population, like alcoholics, they are a heterogeneous group and in any sample there will always be some who do not fit the above description. This is particularly important when small numbers of subjects are used as many features may be minimized or maximized depending on the sample. The results of the research on drunken drivers does suggest, however, that there are very real differences between this group and the general population.

The realization that most drunken drivers are not merely social drinkers who were unlucky enough to get caught after a rare drinking binge has important implications for the legal processing of such offenders. It is suggested that all persons convicted for driving with an excess BAL be assessed in order to ascertain the true extent of their drinking problem, and that those with such a problem be referred for treatment. Not only could this prove to be an effective procedure for reducing the probability of reoffending, but it also provides an invaluable opportunity for early intervention in alcoholism.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS FOR FURTHER RESEARCH

While drunken drivers can be distinguished from the general population on the basis of certain demographic and drinking variables, there is as yet no clear evidence to show that they share any specific personality traits or have a particular personality profile. Furthermore, based on the research to date, they do not constitute a subgroup of the criminal or drug user populations with respect to the Eysenckian personality constructs, and they do not differ from normal controls on measures of these factors. Further research into the drinking patterns and practices of drunken drivers, and their attitudes towards driving while intoxicated, may help to clarify the antecedents of this behaviour, specifically with regard to:

(i) the location of the drinking place (inner city or suburban) and the distance travelled to reach it,

(ii) the number of hours spent drinking prior to the driving offence,

(iii) the availability of food at the drinking place, and the amount of food consumed by the driver prior to, or during the drinking session,

(iv) the company in which the driver had been drinking (close friends, acquaintances, alone),

(v) whether any attempt had been made to prevent the driver from leaving in his/her intoxicated state,

(vi) the extent to which the driver perceived himself/herself as being intoxicated on leaving the drinking place,

(vii) the driver's attitude as to the seriousness of the offence of driving while intoxicated,

(viii) the extent to which the driver believes that he/she has a drinking problem.

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REFERENCES

Anderson, M. Impaired drivers' course. Do they make a difference? Paper presented at the Alcohol Research Seminar, Nelson, N. Z., May 1979.

Bailey, J. P. M. Alcohol Impaired Blood-Sampled Drivers. Chemistry Division Report No. 2283 New Zealand Department of Scientific and Industrial Research, 1979a.

Bailey, J. P. M. Alcohol Involvement in Fatal Road Accidents. Chemistry Division Report No. 2281 New Zealand Department of Scientific and Industrial Research, 1979b.

Baker, S. P. and Spitz, W. U. Age effects and autopsy evidence of disease in fatally injured drivers. Journal of the American Medical Association, 1970, 214, 1079.

Birrel, J. H. W. Blood alcohol levels in drunk drivers, drunk and disorderly subjects and moderate social drinkers. Medical Journal of Australia, 1965, 2, 949-953.

Birrel, J. H. W. A preliminary note on drinking drivers in Vic. Australia since 1966. Medicine Science and the Law, 1970, 10(1), 38-41.

Black, W. A. M. and Gregson, R. A. M. Time perspective, purpose in life, extraversion and neuroticism in New Zealand prisoners. British Journal of Social and Clinical Psychology, 1973, 12, 50-60.

Bridge, C. J. Alcoholism and Driving. Illinois, USA, Charles Thomas, 1972.

Buros, O. K. The Seventh Mental Measurements Yearbook. New Jersey, The Gryphon Press, 1972.

Buros, O.K. The Eighth Mental Measurements Yearbook. New Jersey, The Gryphon Press, 1978.

Carpenter, J.A. Effects of alcohol on some psychological processes. A critical review with special reference to automobile driving skill. Quarterly Journal of Studies on Alcohol, 1962, 23, 274-314.

Crumbaugh, J.C. Experimental studies in existentialism: New evidence for Noogenic neurosis and the theory of motivation in Frankl's logotherapy. 1968, Unpublished Article.

Crumbaugh, J.C. and Maholick, L.T. An experimental study in existentialism: The psychometric approach to Frankl's concept of Noogenic neurosis. Journal of Clinical Psychology, 1964, 20, 200-207.

Davis, H. What does the P scale measure? British Journal of Psychiatry, 1974, 125, 161-167.

Davis, P. An Occupational Prestige Ranking Scale for New Zealand. Research Report 24, Department of Psychology and Sociology, University of Canterbury, NZ, 1974.

Eysenck, H.J. and Eysenck, S.B.G. Manual of the Eysenck Personality Questionnaire. London, Hodder and Stoughton, 1975.

Eysenck, H.J. and Eysenck, S.B.G. Psychoticism as a Dimension of Personality. London, Hodder and Stoughton, 1976.

Eysenck, S.B.G. and Eysenck, H.J. Scores on three personality variables as a function of age, sex and social class. British Journal of Social and Clinical Psychology, 1969, 8, 69-76.

Eysenck, S.B.G. and Eysenck, H.J. Crime and personality: An empirical study of the three-factor theory. British Journal of Criminology, 1970, 10, 225-239.

Eysenck, S. B. G. and Eysenck, H. J. A comparative study of criminals and matched controls on three dimensions of personality. British Journal of Social and Clinical Psychology, 1971, 10, 362-366.

Eysenck, S. B. G. and Eysenck, H. J. The questionnaire measurement of psychoticism. Psychological Medicine, 1972, 2, 50-55.

Fine, E. W., Scoles, P. and Mulligan, M. Under the influence. Public Health Reports, 1975 (Sept-Oct), 90(5), 424-429.

Forbes, A. R. Some correlates of psychoticism. The New Zealand Psychologist, April 1973, 2(1), 2-14.

Forbes, A. R. Some correlates of psychoticism revised and revisited. The New Zealand Psychologist, April 1976, 5(1), 26-36.

Fox, B. H. and Fox, J. H. (eds). Alcohol and Traffic Safety. Public Health Service Publication 1043, 1963.

Hart, D. N. J., Cotter, P. W. and Macbeth, W. A. A. G. Christchurch traffic trauma survey: Part 1, Blood alcohol analysis. The New Zealand Medical Journal, 1975, 81, 503-507.

Hurst, P. M. Drinking Drivers in New Zealand. Are We Testing the Right People? Paper presented at the Alcohol Research Seminar, Nelson, NZ, May 1979.

Jacobson, G. R., Ritter, D. P. and Mueller, L. Purpose in life and personal values among adult alcoholics. Journal of Clinical Psychology, 1977, 33(1), 314-316.

Johnston, J. R. Alcohol and road accidents - a review of the problem. Australian Journal of Alcoholism and Drug Dependence, 1976, 3, 102-107.

Jorm, A. F. Personality and type of criminal offence. Australian and New Zealand Journal of Criminology, 1977, 10, 115-119.

Kendell, R. E. The Role of Diagnosis in Psychiatry. London, Blackwell Scientific Publications, 1975.

Kirkwood, B. J. The 1976 Road Safety Research Seminar. The New Zealand Psychologist, 1976, 5(2), 91-97.

Little, A. D. The State of the Art of Traffic Safety: A Comprehensive Review of Existing Information. New York, Praeger Publishers, 1970.

McDermott, F. T. The alcohol problem on the road. Australian Family Physician, Nov. 1977, 6(11), 1399-1404.

McMurray, L. Emotional stress and driving performance: The effect of divorce. Behavior Research in Highway Safety, 1970, 1, 100-114.

Miller, W. R. Alcoholism scales and objective assessment methods: A review. Psychological Bulletin, 1976, 83(4), 649-674.

National Institute on Alcohol Abuse and Alcoholism. Alcohol and Alcoholism: Problems Programs and Progress. DHEW Publication No. (HSM) 72-9127, Revised, 1972.

Orford, J. A study of the personalities of excessive drinkers and their wives, using the approaches of Leary and Eysenck. Journal of Consulting and Clinical Psychology, 1976, 44(4), 534, 545.

Padelford, B. L. Relationships between drug involvement and purpose in life. Journal of Clinical Psychology, 1974, 30, 303-305.

Pelz, D. C., McDole, T. L. and Schuman, S. H. Drinking-driving behavior of young men in relation to accidents. Journal of Studies on Alcohol, 1975, 36(7), 956-972.

Perrine, M.W. Identification of personality, attitudinal, and biographical characteristics of drinking drivers. Behavioral Research in Highway Safety, 1970, 1(4), 207-226.

Popham, R.E. Alcoholism and traffic accidents. A preliminary study. Quarterly Journal of Studies on Alcohol, 1956, 17, 225-232.

Reker, G.T. The purpose in life test in an inmate population: An empirical investigation. Journal of Clinical Psychology, 1977, 33, 688-693.

Reker, G.T. and Cousins, J.B. Factor structure, construct validity and reliability of the seeking of neotic goals (SONG) and purpose in life (PIL) tests. Journal of Clinical Psychology, 1979, 35, 85-91.

Sandler, I., Palmer, S., Holmen, M. and Wnykoop, R. Drinking characteristics of DWI's screened as problem drinkers. Alcohol Health and Research World, 1975, Exp. Issue, 19-23.

Schmidt, W.S. and Smart, R.G. Alcoholics, drinking and traffic accidents, Quarterly Journal of Studies on Alcohol, 1959, 20, 631-644.

Selzer, M.L. The Michigan Alcoholism Screening Test; The quest for a new diagnostic instrument. American Journal of Psychiatry, 1971, 127, 1653-1658.

Selzer, M.L., Payne, C.E., Gifford, J.D. and Kelly, W.L. Alcoholism, mental illness and the "drunk driver". American Journal of Psychiatry, 1963, 120, 326-331.

Selzer, M.L., Rogers, J.E. and Kerrs, S. Fatal accidents: The role of psychopathology, social stress and acute disturbance. Journal of Psychiatry, 1968, 124, 1028-1036.

Selzer, M.L., Vanosdall, F. and Chapman, M. Alcoholism in a problem driver group: A field trial of the Michigan Alcoholism Screening Test (MAST). Journal of Safety Research, 1971 (Dec.), 3(4), 176-181.

Selzer, M.L., Vinokur, A. and Wilson, T.D. A psychosocial comparison of drunken drivers and alcoholics. Journal of Studies on Alcohol, 1977, 38(7), 1294-1312.

Shaw, D.M., MacSweeney, D.A., Johnson, A.L. and Merry, J. Personality of alcoholic and depressed patients. British Journal of Psychiatry, 1975, 126, 56-59.

Signori, E.I. and Bowman, R.G. On the study of personality factors in research on driving behavior. Perceptual and Motor Skills, 1974, 38, 1067-1076.

Smart, R.G. On alcoholics and their accidents. Journal of Safety Research, 1969, 1, 170-173.

Strom, K.R. and Tranel, N.N. An experimental study of alcoholism. Journal of Religion and Health, 1967, 6, 242-249.

Teasdale, J.D., Segraves, R.T. and Zacune, J. 'Psychoticism' in drug-users. British Journal of Social and Clinical Psychology, 1971, 10, 160-171.

Venardos, M.G. A Descriptive Analysis of Drunk Drivers: Demographic, Behavioural, and Psychometric Characteristics. Ph.D. Thesis, 1975, University of New Mexico. Dissertation Abstracts International, 1976, 36(10-13), 5240.

Verma, R.M. and Eysenck, H.J. Severity and type of psychotic illness as a function of personality. British Journal of Psychiatry, 1973, 122, 573-585.

Waller, J.A. Patterns of traffic accidents and violations related to drinking and to some medical conditions. Quarterly Journal for Studies on Alcohol Supplement, 1965, 4, 118-136.

Waller, J.A. Identification of problem drinking among drunken drivers. Journal of the American Medical Association, 1967, 200, 114-120.

Waller, J.A. Impaired driving and alcoholism: Personality or pharmacological effect? Journal of Safety Research, 1969, 1, 174-177.

Whitlock, F.A., Tonge, J.I., O'Reilly, M.J.J., Davison, A., Johnston, N.G. and Biltoft, R.P. The drinking driver or the driving drinker. The Medical Journal of Australia, 1971, 2, 5-16.

Zung, B.J. and Charalampous, K.D. Item analysis of the Michigan Alcoholism Screening Test. Journal of Studies on Alcohol, 1975, 36(1), 127-132.

APPENDIX A: Scoring for the Michigan Alcoholism Screening Test (MAST)

Questions	Answers with weighted scoring	
	Yes	No
1. Do you ever feel you are a normal drinker (i.e. you drink as much or less than most people)?		2
2. Have you ever awakened in the morning after some drinking the night before and found that you could not remember a part of the evening before?	2	
3. Does your wife (or parents) ever worry or complain about your drinking?	1	
4. Can you stop drinking without a struggle after one or two drinks?		2
5. Do you ever feel bad about your drinking?	1	
6. Do friends or relatives think you are a normal drinker?		2
7. Do you ever try to limit your drinking to certain times of the day or to certain places?	0	
8. Are you always able to stop drinking when you want to?		2
9. Have you ever attended a meeting of Alcoholics Anonymous (AA)?	5	
10. Have you ever got into fights when drinking?	1	
11. Has drinking ever created problems with you and your wife?	2	
12. Has your wife (or any other family member) ever gone to anyone for help about your drinking?	2	
13. Have you ever lost friends, girlfriends or boyfriends because of drinking?	2	
14. Have you ever got into trouble at work because of drinking?	2	

	Answers with weighted scoring	
	Yes	No
15. Have you ever lost a job because of drinking?	2	
16. Have you ever neglected your obligations, your family, or your work for two or more days in a row because you were drinking?	2	
17. Do you ever drink before noon?	1	
18. Have you ever been told that you have liver trouble?, cirrhosis?	2	
19. Have you ever had delirium tremens (DTs), severe shaking, heard voices or seen things that weren't there after heavy drinking?	2	
20. Have you ever gone to anyone for help about your drinking?	5	
21. Have you ever been in a hospital because of drinking?	5	
22. Have you ever been a patient in a psychiatric hospital or on a psychiatric ward of a general hospital where drinking was a part of the problem?	2	
23. Have you ever been seen at a psychiatric or mental health clinic, or gone to a doctor, social worker or clergyman with an emotional problem in which drinking had played a part?	2	
24. Have you ever been arrested, even for a few hours, because of drunk behaviour?	2	
25. Have you ever been arrested for drunk driving or driving after drinking?	2	

APPENDIX B: The Purpose in Life Test (Part A)

Obtainable from J. C. Crumbaugh and L. T. Maholick, Psychometric Affiliates, Chicago Plaza, P. O. Box 157, Brookport, Illinois, USA 62910.

NAME: ..... DATE: .....

AGE: ..... SEX: .....

THE PURPOSE IN LIFE TEST

For each of the following statements, circle the number that would be most nearly true for you. Note that the numbers always extend from one extreme feeling to its opposite kind of feeling. "Neutral" implies no judgement either way. Try to use this rating as little as possible.

1. I am usually:

1	2	3	4	5	6	7
completely bored			(neutral)			exuberant, enthusiastic

2. Life to me seems:

7	6	5	4	3	2	1
always exciting			(neutral)			completely routine

3. In life I have:

1	2	3	4	5	6	7
no goals or aims at all			(neutral)			very clear goals and aims

4. My personal existence is:

1	2	3	4	5	6	7
utterly meaningless, without purpose			(neutral)			very purposeful and meaningful

5. Every day is:

7	6	5	4	3	2	1
constantly new and different			(neutral)			exactly the same

6. If I could choose, I would:

1	2	3	4	5	6	7
prefer never to have been born			(neutral)			like nine more lives just like this one.

7. After retiring, I would:

7	6	5	4	3	2	1
do some of the exciting things I have always wanted to			(neutral)			loaf completely the rest of my life.

8. In achieving life goals I have:

1	2	3	4	5	6	7
made no progress whatever			(neutral)			progressed to complete fulfilment

9. My life is:

1	2	3	4	5	6	7
empty, filled only with despair			(neutral)			running over with exciting good things

10. If I should die today, I would feel that my life has been:

7 6 5 4 3 2 1
very worthwhile (neutral) completely worthless

11. In thinking of my life, I:

1 2 3 4 5 6 7
often wonder why I exist (neutral) always see a reason for my being here

12. As I view the world in relation to my life, the world:

1 2 3 4 5 6 7
completely confuses me (neutral) fits meaningfully with my life

13. I am a:

1 2 3 4 5 6 7
very irresponsible person (neutral) very responsible person

14. Concerning man's freedom to make his own choices, I believe man is:

7 6 5 4 3 2 1
absolutely free to make all life choices (neutral) completely bound by limitations of heredity and environment

15. With regard to death, I am:

7 6 5 4 3 2 1
prepared and unafraid (neutral) unprepared and frightened

16. With regard to suicide, I have:

1 2 3 4 5 6 7
thought of it seriously as a way out (neutral) never given it a second thought

17. I regard my ability to find a meaning, purpose, or mission in life as:

7 6 5 4 3 2 1
very great (neutral) practically none

18. My life is:

7 6 5 4 3 2 1
in my hands and I am in control of it (neutral) out of my hands and controlled by external factors

19. Facing my daily tasks is:

7 6 5 4 3 2 1
a source of pleasure and satisfaction (neutral) a painful and boring experience

20. I have discovered:

1 2 3 4 5 6 7
no mission or purpose in life (neutral) clear-cut goals and a satisfying life purpose